MARCH 10, 1958

STEEL
The Metalworking Weekly

A PENTON PUBLICATION

Housing in 1958: 1 Million Starts

Volume will be only slightly better than 1957's, but metalworking's share will rise substantially . . . *Page* 79

Do-It-Yourself Gains

How to participate in a $15-billion annual market that has been recession-proof thus far . . . *Page* 90

2 Steps to Machining Economy

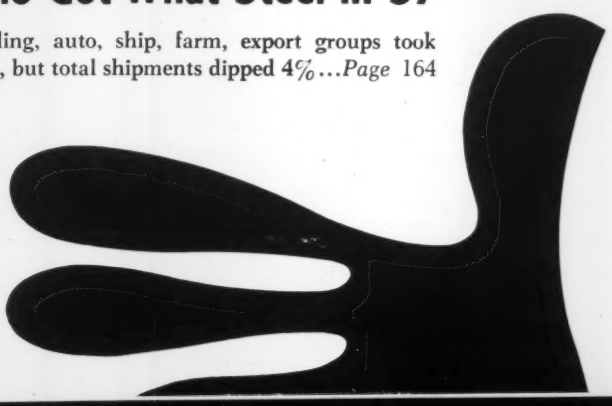
How disposable cutter tips and optimum speeds saved one company more than $100,000 last year . . . Page 144

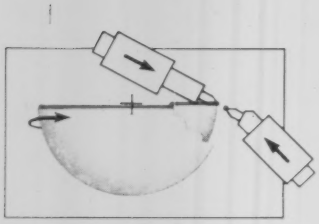
Manhour Waste Cut

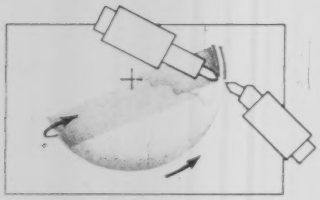
Emil J. Paidar Co. beats the cost crisis by revamping its plating line and boosting production . . . *Page* 124

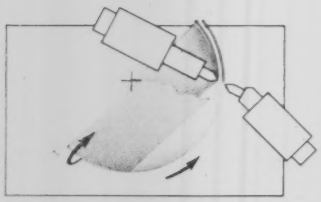
Who Got What Steel in '57

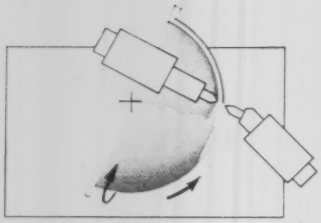
Building, auto, ship, farm, export groups took more, but total shipments dipped 4%...*Page* 164

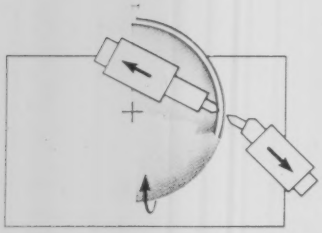


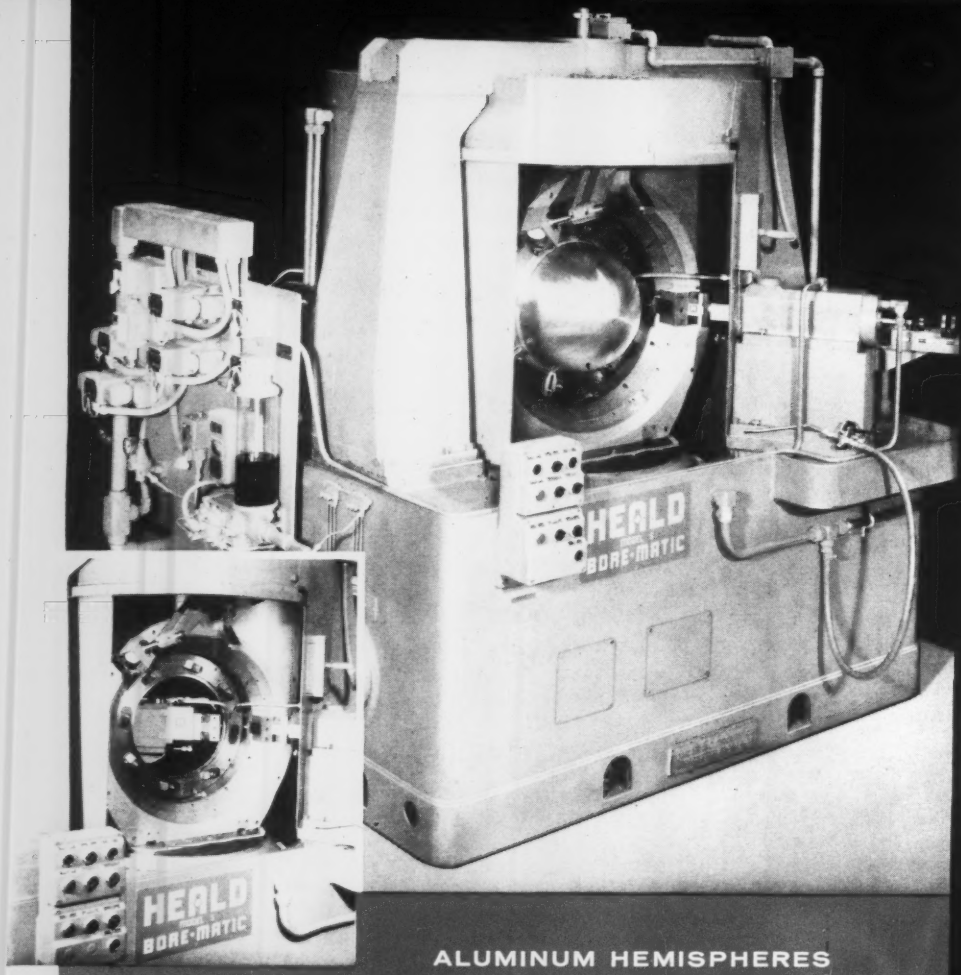












ALUMINUM HEMISPHERES

SPHERICALLY BORIZED

on I.D. and O.D. Simultaneously

Putting a precision finish on aluminum hemispheres is the job done by the Heald Model "S" Bore-Matic shown above.

These large hemispheres require stock removal from both the I.D. and O.D., maintaining desired hemispherical shape and critical wall thickness.

The work is rim-clamped in a rotating fixture which is arranged to pivot on a vertical axis at the center of curvature. Stationary opposing tooling, mounted on two hydraulically operated slides, bores and turns the I.D. and O.D. *simultaneously*, as shown by the simplified schematic drawings at the left. Size tolerance is held to ± .0005 on I.D. and O.D. for maintaining critical uniform wall thickness. A dial indicator permits checking finish size before removing work from the machine.

This is an interesting example of the ability of a Heald Bore-Matic to meet unusual precision-finishing requirements with important savings in time, effort and expense—another reason why it pays to come to Heald.

THE HEALD MACHINE COMPANY

Subsidiary of The Cincinnati Milling Machine Co.

Worcester 6, Massachusetts

Chicago • Cleveland • Dayton • Detroit • Indianapolis • New York

HEALD

"Wooden" television cabinets from steel sheets

Although from ten feet away they look like richly grained and polished wood, many television cabinets are made from sheet steel. First, the steel sheet is shaped in die and press-brake operations into a shell, then braced and gusseted for rigidity. Next, the unit is cleaned and Bonderized for painting.

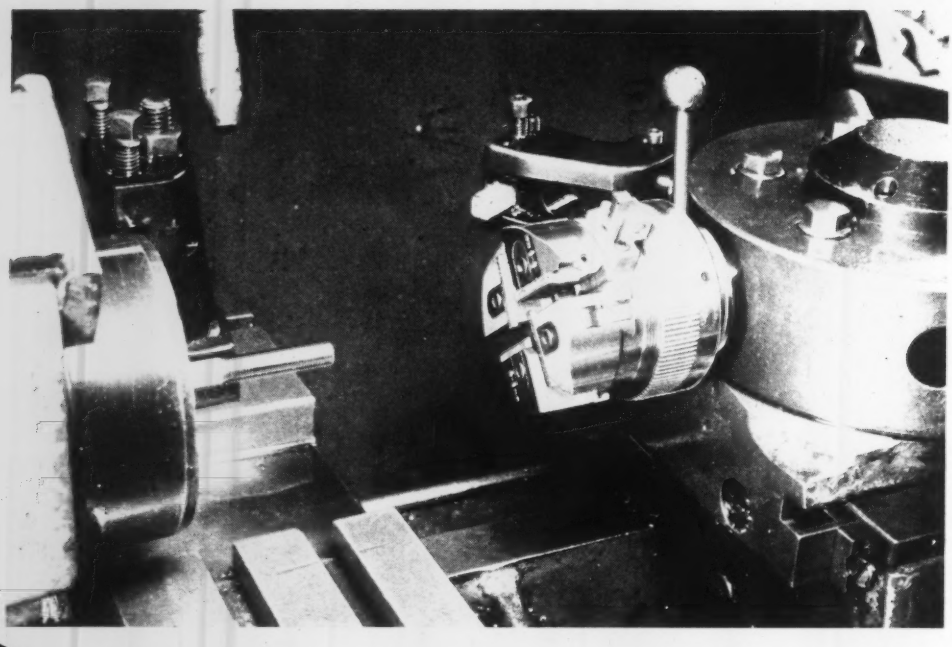
After the first protective coating of paint has been baked on, the graining is applied by a roller, much the same as on a printing press. The final glaze coating imparts a satiny finish to the cabinet, and the unit is then ready to receive its "works."

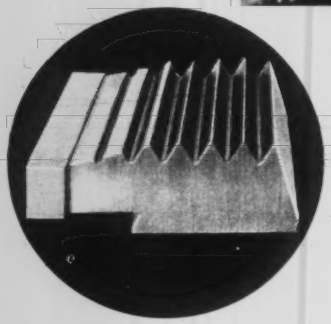
Bethlehem supplies cold-rolled sheets to some of the leading producers of steel television cabinets, air conditioners, and similar niceties of today's living. These manufacturers know they can count on Bethlehem to furnish sheets as finely finished, as easy-forming, as true to gage as any on the market. We'll be glad to discuss your sheet steel requirements with you. Just call our nearest office for prompt action. Or write to the address below.

BETHLEHEM STEEL COMPANY, BETHLEHEM, PA.

On the Pacific Coast Bethlehem products are sold by Bethlehem Pacific Coast Steel Corporation. *Export Distributor:* Bethlehem Steel Export Corporation.

BETHLEHEM STEEL





CONCENTRICITY HELD TO .002"

between workpiece O. D. and thread with **LANDIS** *Die Head*

Centering Throat Chasers enabled the LANDMATIC Head to solve a difficult threading problem at the Minneapolis-Honeywell Regulator Co., Valve Division, in Philadelphia, Pa.

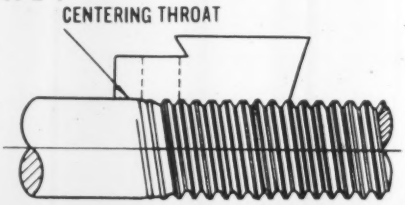
Threads on valve stems for diaphram control valves were required to meet a concentricity tolerance of .002" total indicator reading. The 5HH LANDMATIC Hardened and Ground Head using Centering Throat Chasers is the only head tested capable of producing these results.

These Centering Throat Chasers are specifically designed for producing threads requiring a high degree of concentricity with the outside diameter of the workpiece. As indicated on the drawing, the centering throat section protrudes from the chaser cutting edge—to act as a work-aligning and -supporting surface.

To produce these stems, 3/8" 24-pitch UNF threads are cut 1-5/8" long on 316 stainless steel at 30 SFM to Class 3 tolerances. Entire lots of 400 pieces are run without regrinding the chasers.

LANDMATIC Hardened and Ground Heads are available in four sizes to thread all diameters from 3/16" to 2".

For additional information, please ask for Bulletin F-80.



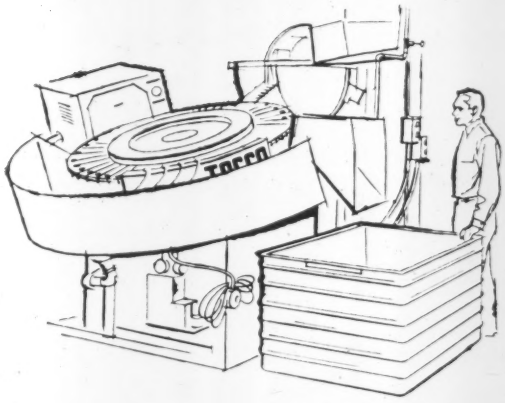
474

LANDIS *Machine* COMPANY

WAYNESBORO • PENNSYLVANIA • U. S. A.

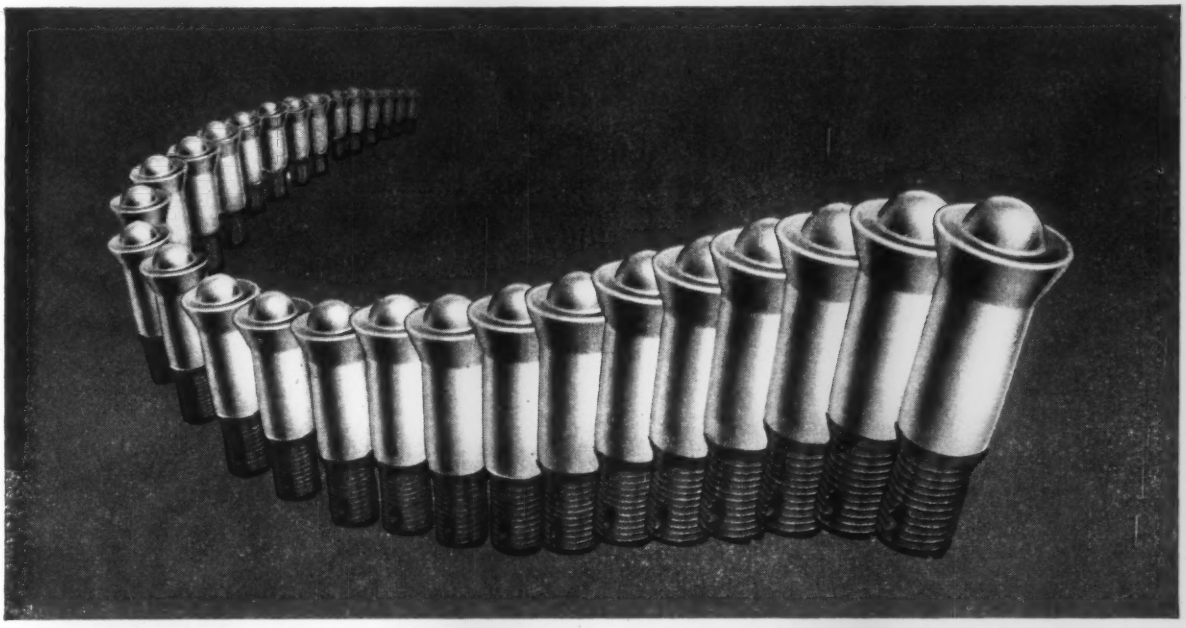
These **THREADING TOOLS** displayed at Booth 1538 ASTE Show

THOMPSON PRODUCTS ANNEALS THREADS ON BALL STUDS



ONE A SECOND!

with TOCCO* *Induction Heating*



Up Goes Production—When progressive engineers at Thompson's Michigan Division switched from conventional gas annealing to fully automatic TOCCO for annealing threads on automotive ball studs, production jumped from 2128 to 3226 parts per hour —an increase of over 50%.

Localized TOCCO heating draws threads from 60 to 30 Rockwell C, using 50 kw at a frequency of 10,000 cycles per second.

Down Go Costs—While production zoomed, costs dropped sharply with TOCCO annealing—a reduction of 34% in direct labor costs alone. With an average monthly output of 350,000 of these parts, Thompson saves thousands of dollars per year with TOCCO.

If you heat metal parts for annealing, forging, brazing or hardening, investigate how TOCCO can up *your* production and lower *your* costs.

THE OHIO CRANKSHAFT COMPANY

Mail Coupon Today— **NEW FREE Bulletin**

The Ohio Crankshaft Co. • Dept. S-3, Cleveland 5, Ohio

Please send copy of "Typical Results of TOCCO Induction Hardening, Heat-Treating and Annealing".

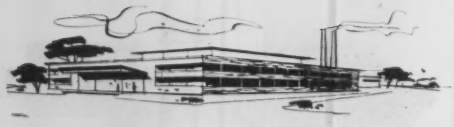
Name_____

Position_____

Company_____

Address_____

City_____ **Zone**____ **State**_____



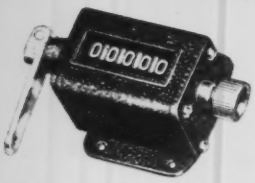
No Two Plants

are alike...

but all can count on VEEDER-ROOT

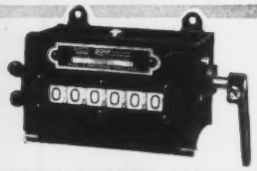
Sure, everybody's manufacturing problems are "different." But when these problems involve mechanical or electrical *Count*rol, they can *all* get the right answer from the same man . . . the Veeder-Root Distributor.

You will find that this man is tops in his field. He knows industry, and he knows how to adapt and apply standard Veeder-Root Counters to all types of production machines and processes, to give you exactly the facts-in-figures you need. If it's a question of quality, volume, cost inventory, production, wage or incentive payment, remember that *you're never sure unless you count*. And remember that the man you can always count *on* is your Veeder-Root Distributor. If you don't know who he is, just drop a line to D. G. Dresser, Veeder-Root Inc., Hartford 2, Conn.



SMALL RESET COUNTER

A compact, rugged reset counter for moderate duty in parts inspection, quality control, conveyors, machine tools, light presses, etc.
Dimensions: 1¾" long, 1 19/64" high, 1 7/16" wide.
Speed: Up to 1000 counts per minute.



BOX-TYPE RESET COUNTER

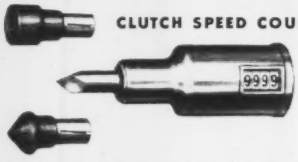
For punch press installations, conveyors, metal-working equipment, die casting, plastic-molding, rivet, spring and wire machining, or any installation requiring a heavy duty counter.
Dimensions: 4¼" long, 2 5/32" high, 3⅜" wide.
Speed: 500 counts per minute.

RESET MAGNETIC COUNTER

For remote indication of machine operation from plant to office.
Dimensions: 3 15/16" long, 2½" high, 1⅝" wide.
Speed: Up to 1000 counts per minute.
Coils: 110V-AC are standard. Other voltages are available. Panel mounting feature also available.

HAND TALLY

For quick spot-checks of production or performance.
Dimensions: 1 17/64" long (to end of reset knob), 1¾" deep, 2" high.
Counts one for each depression of the thumb lever, and resets to zero by a turn of the knob.



CLUTCH SPEED COUNTER

For checking to make sure that the machine is operating at the required R.P.M.
Dimensions: 3¼" long, ⅞" max. diameter. Non-Reset.
Internal clutch operates counter only when rubber tip is pressed against the shaft.

Everyone can count on

VEEDER-ROOT

'The Name that Counts'

Hartford, Conn. • Greenville, S. C.
Chicago • New York • Los Angeles
San Francisco • Montreal
Offices and Agents in Principal Cities

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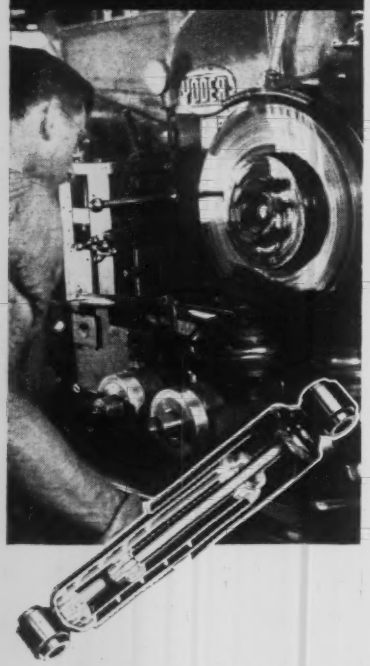
STEEL, the metalworking weekly, is selectively distributed without charge to qualified management personnel with administrative, production, engineering, or purchasing functions in U. S. metalworking plants employing 20 or more. Those unable to qualify, or those wishing home delivered copies, may purchase copies at these rates: U. S. and possessions and Canada, $10 a year; all other countries, $20 a year; single copies, 50 cents. Metalworking Yearbook issue, $2. Published every Monday and copyright 1958 by Penton Publishing Co., Penton Bldg., Cleveland 13, Ohio. Accepted as controlled circulation publication at Cleveland, Ohio.

Index available semiannually. STEEL is also indexed by Engineering Index, 29 W. 39th St., New York 18, N. Y.

Monroe Shock Absorbers rely on Precision Performance of YODER TUBE MILLS

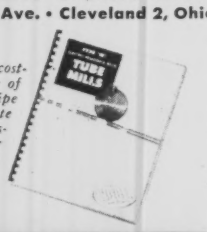


After 15 years of continuous operation the Yoder Type-M Electric-Resistance Weld Tube Mill shown here, is still producing precision tubing for the Monroe Auto Equipment Co., Monroe, Michigan. Yoder produced tubing is the basic component of the famous "Monro-Matic" shock absorber. Measuring 2 1/64" outside diameter (plus several other sizes) the tubing is made from 22 gauge strip in one continuous operation . . . it is automatically cold-roll formed, welded and cut to pre-determined lengths.

This typical installation of a Yoder tube mill exemplifies the accuracy, dependability and production economies of Yoder-made tubing. If your business requires pipe or tubing, ferrous or non-ferrous, in sizes from 1/4" to 26" diameters, there is a Yoder mill designed to produce it economically, efficiently and accurately.

THE YODER COMPANY
5502 Walworth Ave. • Cleveland 2, Ohio

Check into the many cost-saving advantages of operating a Yoder pipe or tube mill . . . write for the fully-illustrated 88-page Yoder Tube Mill Book . . . it is yours for the asking.



ENGINEERING YODER MANUFACTURING **PIPE AND TUBE MILLS** (ferrous or non-ferrous)

behind the scenes

Cost Crisis: Continued

A story that bobs up every spring concerns the exuberant seed salesman. When asked if his products were fast growing, he replied, "Madam, my advice to you is this: Just plant 'em—and then stand back!" This warning might apply even to the editors of STEEL. Several weeks ago (STEEL, Feb. 3), they sowed an idea for a Cost Crisis Competition and before they could stand aside, requests for entry blanks knocked them off their feet.

Editor Walt Campbell was pleased as well as astonished. "While the interest generated by STEEL's Cost Crisis Competition is tremendous," he explained, "it is not unusual because the subject really concerns business survival. The cost crisis, you know, is created by leveling or shrinking sales volume, greater resistance to price increases, and continuing upward cost pressures. Metalworking organizations faced with these conditions are obliged to do something about them, or else!"

Obviously, they are doing something about them. At this writing, they are demanding contest entry blanks by the bushel. Three weeks after the announcement, metalworking companies had requested more than 2000. (Entry blanks, not bushels.)

Reader response has been universally favorable. "Never saw anything like it," whispered Copy Editor Harry Chandler, sucking thoughtfully on a blue pencil. "Everybody's for it. That seems to put it in a class with puppy dogs, babies, motherhood, and Abraham Lincoln."

Assistant Editor Eileen Cortes kindly showed us an impressive volume of letters concerning the contest. "You'll find some wonderful comments here," she fluttered, "which you may use if you wish." At the same time, her big brown eyes mirrored an apprehension which she was unable to hide. Eileen handles "Letters to the Editors," and if we had stolen some of her prized communications, where would that have left her?

We shall continue to make progress reports on the Cost Crisis Competition. Keep your eye on this space for developments.

Ave Atque Vale

A fragment from the second chapter of the *Revelation* of Saint John the Divine goes: "I know thy works, and thy labor, and thy patience, and how thou canst not bear them which are evil. . . ," and somehow it brings to mind STEEL's venerable Steel Plant Editor John Knox. Mr. Knox retired last week, after a 41-year editorial stint. An event of this nature cannot be glossed over. STEEL was known as *The Iron Trade Review* when John forsook a blast furnace for a typewriter. That was back in 1917, when another generation was engaged in the usual war to end war. "I saw a classified ad in the old *Iron Trade Review*," John recalled. "It called for a man who knew the iron and steel business. 'You supply the practical experience,' it said. 'We'll teach you how to write.' Well, I came in for an interview, and I got the job."

At the time he saw the ad, John was a blast furnace foreman at the American Steel & Wire Div., U. S. Steel, in Cleveland. When he closed his desk last week and walked out, he was perhaps the best informed steel plant man in the whole country—and still is, for that matter.

We didn't mention *Revelation* back there just by accident. John is more than a formidable Christian: He is a practicing one. He would grow nervous and self-conscious if we were to broadcast his good works; his labors among the underprivileged, the alcoholics, the social unfortunates. He could switch from a steel plant to a typewriter to a pulpit, and never cross himself up. Most of us are born gossips, whether we care to admit it or not, but up to now nobody ever heard Jack Knox repeat anything derogatory about anybody.

When a man puts on his coat and hat for the last time after 41 years on the job, what can his friends and associates say? Good luck? Don't take no wooden nickels? No. Let us, instead, say thank you, Jack, for having been with us.

Artists Put on Spot

This time we wish to show up the artists. A year or so ago, STEEL's artists selected ten ads, and you were asked to guess which one they picked? Let's turn the tables: You select the ten best ads in this week's STEEL; number them one to ten in the order of your preference; and tell ol' Shrdlu in strictest confidence. We'll average them out, then test the artists. Artists who fail to match the average selection will be declared dummies, or something, and will be required to supply an original watercolor painting, which we will award to the winners. They'll be selected by the latest scientific method: A sweet young thing in a bikini will draw the lucky names from a hat.

If you are already working on your Cost Crisis entry, please finish that first. Then finish your regular work. Then, just before quitting time, if you have nothing better to do, select the ten best ads in this issue (marked in order of preference). Mail 'em to ol' Shrdlu, and we'll do the rest.

Shrdlu

(Metalworking Outlook—Page 73)

The answer is easy: when it's an ELASTIC STOP® nut. ESNA makes and stocks more types, shapes and sizes (in a larger variety of materials and finishes) than any other lock nut manufacturer. In fact, all of the nuts shown here are standard production parts.

Every one of these fasteners is self-locking anywhere on the bolt, will remain tight under severe vibration . . . yet they can be dis-assembled and re-used many times. What's more, the performance of the red locking insert has proved itself in critical applications on American heavy industrial equipment for more than twenty-five years.

All ESNA nuts are carefully controlled in manufacture as to finished dimensions, class of thread fit and finish. This control pays off—in uniform quality every time you order.

Simplify and speed up your purchases by sending for a free catalog on ESNA's extensive line.

ELASTIC STOP NUT CORPORATION OF AMERICA

ESNA TRADE MARK / ROLLPIN TRADEMARK

Clip Coupon for Complete Catalog

Elastic Stop Nut Corporation of America
Dept. N26-360, 2330 Vauxhall Road, Union, New Jersey

Gentlemen: Please send me your free, complete ELASTIC STOP nut catalog.

Name_____ Title_____

Firm_____

Street_____

City_____ Zone_____ State_____

Missing Something?

Switch to PINK CIMCOOL

If you'd really like to be on the ball and improve your score in the cost department, then you too, should switch to CIMCOOL® S2 Concentrate. You can't miss, for CIMCOOL is actually the largest selling chemical cutting fluid in the world. And, with good reason.

CIMCOOL LOWERS COSTS because it's longer lasting in machines. Therefore, it reduces downtime and cuts labor costs for cleaning and changing.

CIMCOOL PERMITS FASTER SPEEDS and feeds, because of its chemical lubricity. It combines friction reduction and cooling capacity in a degree never before attained by old fashioned lubricants.

CIMCOOL IS CLEANER TO USE because it doesn't soil hands or clothing. It contains no skin irritants. And it's safer because it leaves no slippery film on shoes, floor, machine or work. It can't smoke, can't burn, and virtually eliminates rancidity and foul odors.

Three good reasons why you should *switch to* CIMCOOL. We know CIMCOOL Concentrate will keep you out of the rough every day in your plant. So call your CIMCOOL Distributor today. He'll be glad to give you *full* information on all the advantages of CIMCOOL Concentrate —as well as details on the entire family of CIMCOOL Cutting Fluids.

Or contact us direct and we'll have one of our Cincinnati Milling trained machinists call on you—without cost or obligation, of course. Write, wire, or telephone, Sales Manager, Cincinnati Milling Products Division, Cincinnati 9, Ohio.

CIMCOOL CUTTING FLUIDS

CIMCOOL **S2 Concentrate**—The famous pink fluid which still covers 85% of all metal cutting jobs. Effective, economical and clean.

CIMPLUS—The transparent grinding fluid with exceptional rust control. Also used for machining cast iron and as a water conditioner with CIMCOOL Concentrate.

CIMCUT **Concentrates (AA, NC, SS)**—For jobs requiring oil-base cutting fluids. Added to mineral oils, they give economical mixes for higher speeds and feeds.

CIMCOOL **Tapping Compound**—Permits the use of highest tapping speeds and increases tap life amazingly.

Also, CIMCOOL Bactericide and CIMCOOL Machine Cleaner.

for 100% of all metal cutting jobs. The Answer is Pink!

Production-proved products of The Cincinnati Milling Machine Co.

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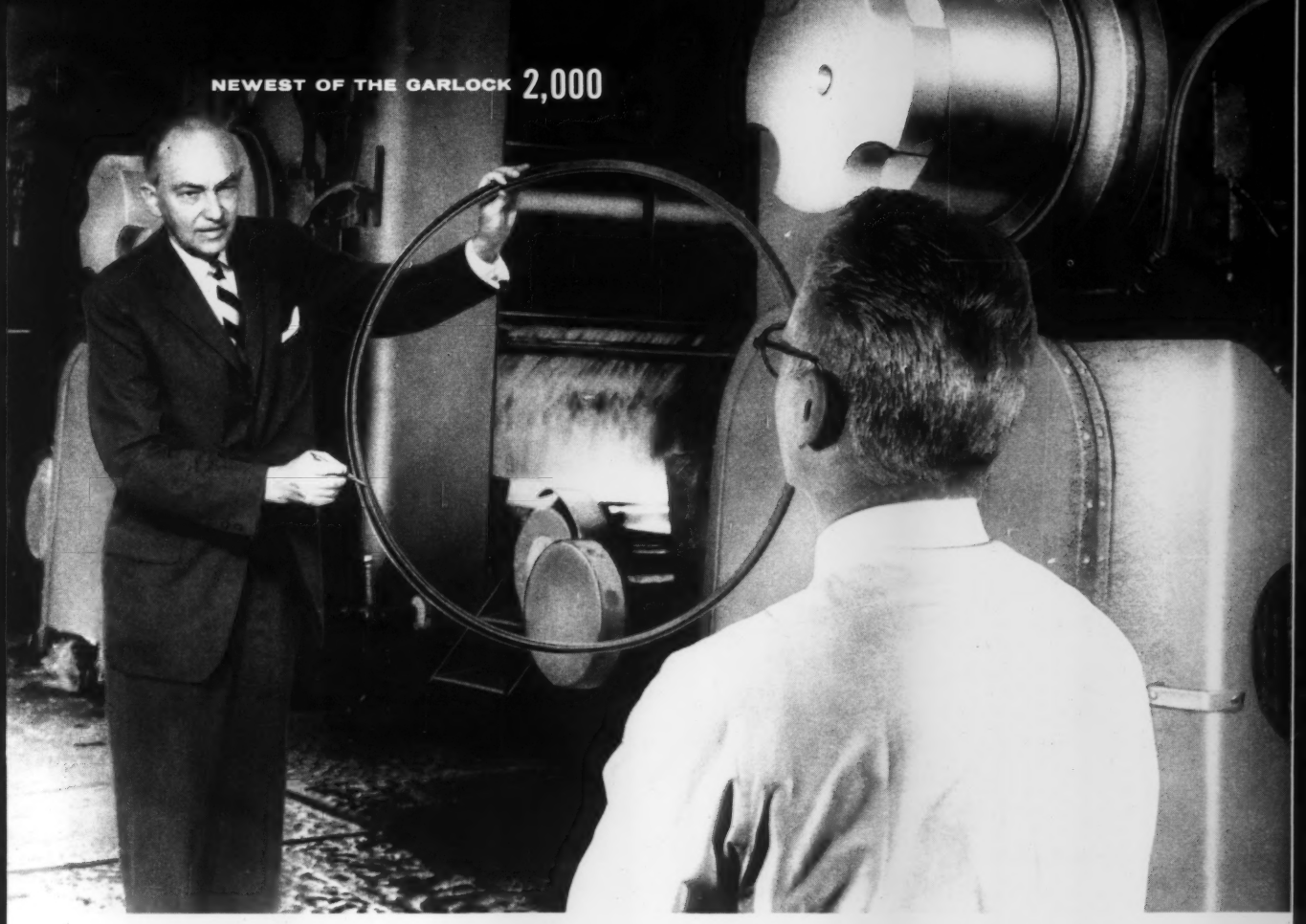
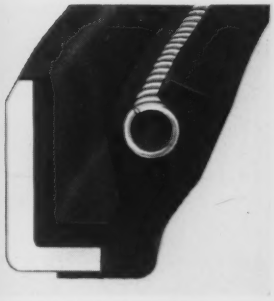


Garlock introduces new low cost KLOZURE* Oil Seals for large shafts

Here's a new KLOZURE Oil Seal that will save you money on initial installation and replacement. It's the new Model 2782 Garlock KLOZURE for large shafts up to 44" diameter operating at normal to high speeds, at temperatures to 275° F., on applications with low pressure differentials of approximately 5 psi. A garter spring holds the Buna-N sealing element in contact with the shaft. A precision formed case molded to the sealing element protects the seal from damage, and provides a press fit for proper installation.

Selection of a KLOZURE Oil Seal for your job is easier and more economical because Garlock has one of the largest stocks in the industry. And KLOZURES, of course, are just a part of the famous Garlock 2,000 . . . two thousand different styles of packings, gaskets, and seals for every need. The *only* complete line. Ask your local Garlock representative for his unbiased recommendation, or write for additional information on the Model 2782 KLOZURE.



Cross section Model 2782 Klozure

THE GARLOCK PACKING COMPANY, Palmyra, New York

For Prompt Service, contact one of our 30 sales offices and warehouses throughout the U.S. and Canada.

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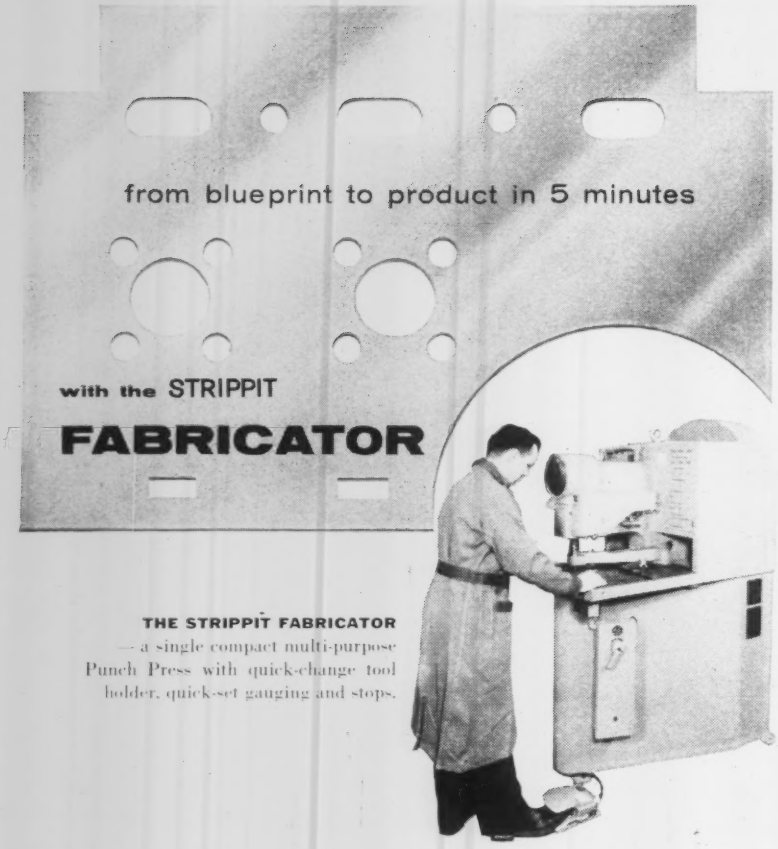
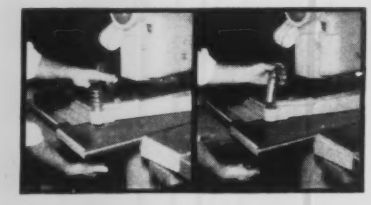


THE STRIPPIT FABRICATOR — a single compact multi-purpose Punch Press with quick-change tool holder, quick-set gauging and stops.

Short run? Complicated pattern? If it's sheet metal up to ¼" mild steel, if it's punching, notching or nibbling, it's profitable on a Strippit Fabricator!

Set up in minutes! Punches and dies are changed in 30 seconds or less, and Strippit guided punches need no aligning or adjusting. Back stop with precision gauge is instantly set by a locking knob. Self-tripping finger stops on gauge bars provide multiple stopping as the work is moved rapidly under the punch. A switch gives you single punching or 165-stroke-a-minute nibbling, and all tools are within quick reach in attached "file drawers" or shelves. The Fabricator is more than a one-machine shop — it's a whole system of quick-change, high-profit fabrication used by thousands of shops.

What's more, you can add the Strippit Positive Duplicator for high-speed punching in medium runs — plus the Dupl-O-Scope to punch Duplicator templates right from the drawing, in a few minutes. Write today for details and demonstration at your plant by the Strippit mobile unit. Warehouse stocks in Chicago and Los Angeles.



TOOL HOLDER is pulled out, for instant removal of die and punch assembly, ready for the next interchangeable tool. 1¼" diameter capacity holder shown. 3½" diameter holder also available.

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WALES STRIPPIT COMPANY

210 Buell Road, Akron, New York

In Canada: Strippit Tool & Machine Limited, Brampton, Ontario

LETTERS TO THE EDITORS

Lauds Cost Crisis Competition

The Cost Crisis Awards Competition announced in your Feb. 10 issue looks like the "real ticket" for proving the role of modern equipment as the principal cost-reducer in manufacturing operations.

Please send me your award kit for entering this contest. We are anxious to contribute the records of several metalworking firms that realized marked cost savings from planned purchases of capital tools and machinery.

John C. Kosky
Manager of Industrial Advertising
Baldwin-Lima-Hamilton Corp.
Philadelphia

• • •

You are carrying on an excellent service to America in your Cost Crisis Competition.

Ernest H. Wakefield
Director
Radiation Counter Laboratories Inc.
Skokie, Ill.

Federal Mediators Like Story

I read with interest your article, "More Labor Mediation in '58" (Jan. 20, Page 40). Many of our commissioners around the country have written to us and told us of favorable comments on the article.

Joseph F. Finnegan
Director
Federal Mediation & Conciliation Service
Washington

Reader for Liberalized Trade

We found your editorial, "What Price Free Trade?" (Feb. 17, Page 71), interesting, but as representatives of a Belgian steel wire mill, we feel you overlook some good reasons for liberalized trade.

The Soviet Union has stated in rather blunt language that it is on an economic offensive against the western world. To keep the economies of our Allies strong, they must be allowed to sell and to buy freely with the U. S. They cannot buy if they cannot sell. For years, U. S. exports have outweighed imports by a considerable margin. American industry needs increased export markets, but the customer cannot buy if he has no money.

To sum up our case, it is essential to the economic well-being of the Free World,

(Please turn to Page 12)

"We get higher recoveries with CHROMTEMP ferrochrome"

Closer chromium control and higher recoveries are obtained by adding CHROMTEMP exothermic ferrochrome to the ladle. Off grade heats are minimized, which means higher plant profits. In addition, this alloy does not preferentially oxidize aluminum added for grain size control. CHROMTEMP ferrochrome is available in three grades which add 5, 8 or 12 points of carbon respectively with each 1% of chromium added. For further information call your ELECTROMET representative.

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More and more companies are learning that it really pays to make full use of their local Steel Service Centers, such as Wheelock, Lovejoy.

They find that by using our extensive local alloy steel stocks, they get cut-to-size steel *without* scrap and wastage . . . without the considerable costs of maintenance and floor space, handling and cutting equipment, taxes and insurance.

Moreover, their needs are filled FAST, due to the speedy local delivery service we offer.

Here is the easy and sensible way for you to avoid burdensome inventory costs, to make more efficient use of your capital and your floor space, and to avoid costly emergencies!

Our complete facilities, service, and stocks are at your disposal. Call in your nearest Wheelock, Lovejoy representative. He will gladly show you how to get the most benefit out of the services we offer.

Write today for your FREE COPY of the Wheelock, Lovejoy Data Book. It contains complete technical information on grades, applications, physical properties, tests, heat treating, etc.

WHEELOCK, LOVEJOY & COMPANY, INC.

131 Sidney Street, Cambridge 39, Mass.

AGENTS:
Southern Engineering Company, Charlotte, N. C.; Sanderson-Newbould, Ltd., Montreal & Toronto

LETTERS

(Concluded from Page 10)

to our country and to its industry, that we continue to liberalize our trade laws. To do otherwise is a backward step and contrary to the philosophy of free enterprise.

James E. Ghio
Beltraco Inc.
Kansas City, Mo.

• *The question is how far we should swing toward free trade. For example, U. S. machine tool builders can deliver tools to their customers from foreign plants at lower cost than they can from plants here at home. If they relocate abroad, where would we be if we got into another war?*

Critical of Outlook Item

The item, "SUB Decision Coming in Ohio," in the Metalworking Outlook in your Feb. 17 issue (Page 67) has been called to my attention. You say: Odds are that the majority of Ohio's voters favor it (SUB) now that we're in a business dip.

You should not be a propagandist for the basic steel industry and the CIO, who now have lain in the same bed. You have absolutely no way of knowing "that the majority of Ohio's voters favor it."

W. Frank Morris
C. E. Morris Co.
Columbus

• *Your point is well taken.*

Series Surpasses Previous Ones

Please send a reprint of your first 1958 Program for Management article, "Balance Your Management" (Feb. 17, Page 113). It appears that this new program will surpass the previous excellent ones.

J. M. Rhodes
General Manager
Marine Fabricators Co.
Perth Amboy, N. J.

Setting the Record Straight

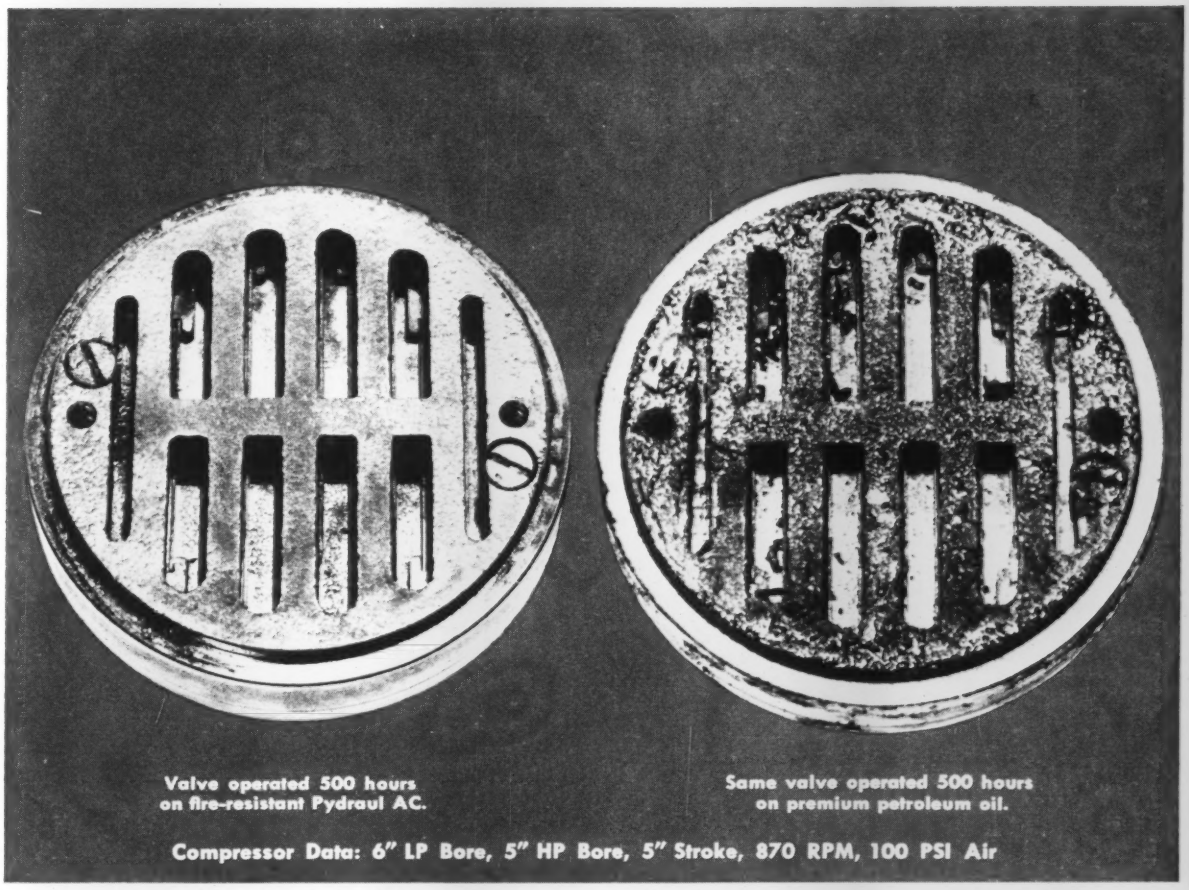
You show a photograph of the reactor vessel for a prototype nuclear powerplant in your Feb. 17 issue (Page 74). The cutlines credit Westinghouse Electric Corp. with its construction. It was built by Foster Wheeler as a subcontractor to Westinghouse.

F. W. Claus
Manager, Public Relations Dept.
Foster Wheeler Corp.
New York

Copper Welding

I recently read the first article in your series, "How To Weld Copper and Its Alloys" (Jan. 27, Page 86), and found it interesting. Please send reprints of all five articles.

Jack R. Davis
Assistant Mechanical Superintendent
Anaconda Co.
Great Falls, Mont.


Valve operated 500 hours
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Same valve operated 500 hours
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Compressor Data: 6" LP Bore, 5" HP Bore, 5" Stroke, 870 RPM, 100 PSI Air

New Pydraul AC lubricant virtually eliminates fire danger two ways—first, by its inherent fire resistance, and second, by keeping air compressor systems freer from flammable carbon deposits. It can actually cut compressor maintenance costs because it runs cleaner, as proved in side-by-side photos of an exhaust valve operated in the same system with only the lubricant changed.

Photo proof: You reduce fire danger—cut upkeep costs with new PYDRAUL AC compressor lubricant

Extensive tests backed by successful field experience throughout industry prove conclusively that Pydraul AC protects against fire and explosion hazards, gives excellent lubricity and can even cut upkeep costs by reducing build-up of carbon deposits within the system.

Fire danger lurks in flammable lubricants and their residue deposited in compressed air cylinders and piping. Eliminate it now in your compressor, any size, any make. Conversion is easy . . . essentially, just drain your flammable oil and replace with fire-resistant Pydraul AC.

Send this coupon for the "full story" technical bulletin on Pydraul AC. It covers everything you ought to know, including detailed properties and field experience.

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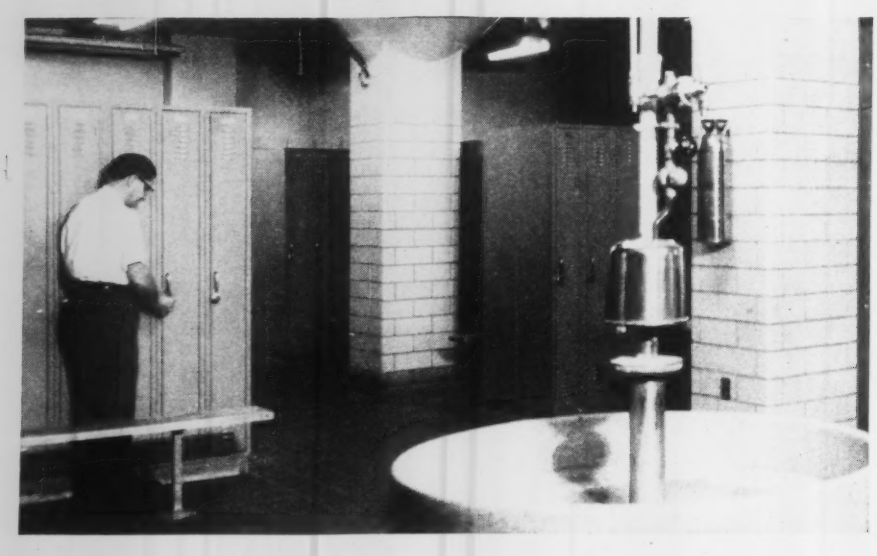

ON-THE-JOB PROTECTION for employee valuables and personal belongings is being provided by Republic Steel Lockers in industrial plants everywhere. They combine smart styling and design with simple construction for fast, easy installation. Republic Steel Lockers provide full inside-locker roominess, sanitation, safety. Bonderized finish is locked on . . . rust is locked out. Republic's Berger Division offers complete planning and installation service. Send coupon for full facts.

Versatile Chateaugay Pig Iron is specified for both castings shown at left. The producer, The Union Metal Manufacturing Company, Canton, Ohio, has found over the years that there is no better nor more economical means for producing consistently top-quality castings or for meeting their customers' strict requirements.

The flywheel is cast in sizes up to 36 inches in diameter. It is used in both stationary and automotive engines. Casting requirements call for a high degree of machinability since one surface serves as a clutch face, plus excellent density to resist the effects of turning at a very high rpm.

The melting pot, used by a large appliance manufacturer in melting aluminum, requires high heat-resistance and maximum density.

Chateaugay's uniform distribution of chemical elements produces a dense grain structure which results in economical machining—plus excellent wear-resistance. Other characteristics of Chateaugay are unequalled by any domestic pig iron, and its high carbon and unusually low sulphur, phosphorus, and manganese contents make it ideally suited for production of ductile cast iron.

A Republic Pig Iron Metallurgist will give you all the facts about Chateaugay and other Republic Irons. As the only producer of both Northern and Southern Iron, Republic offers industry's only complete line of all grades of merchant pig irons. Northern grades include Malleable, Bessemer, Foundry and Basic. Southern furnaces produce Foundry and Basic Irons.

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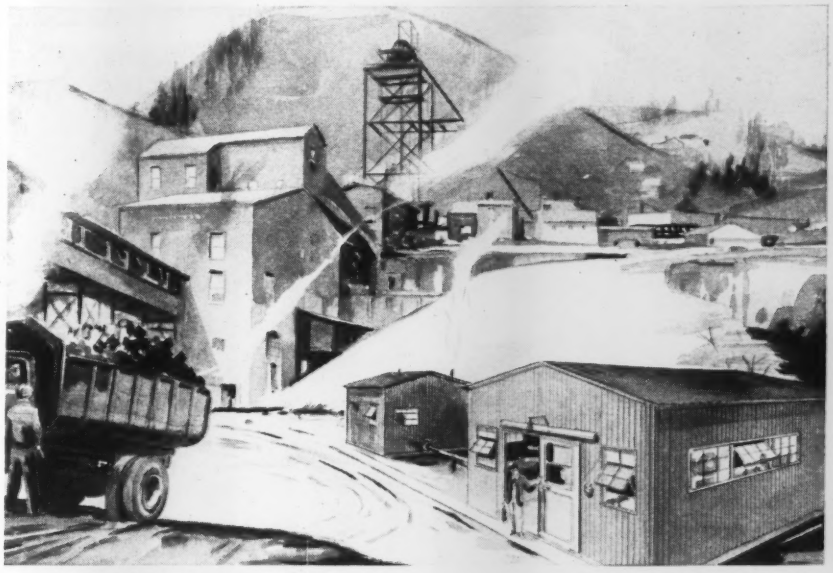

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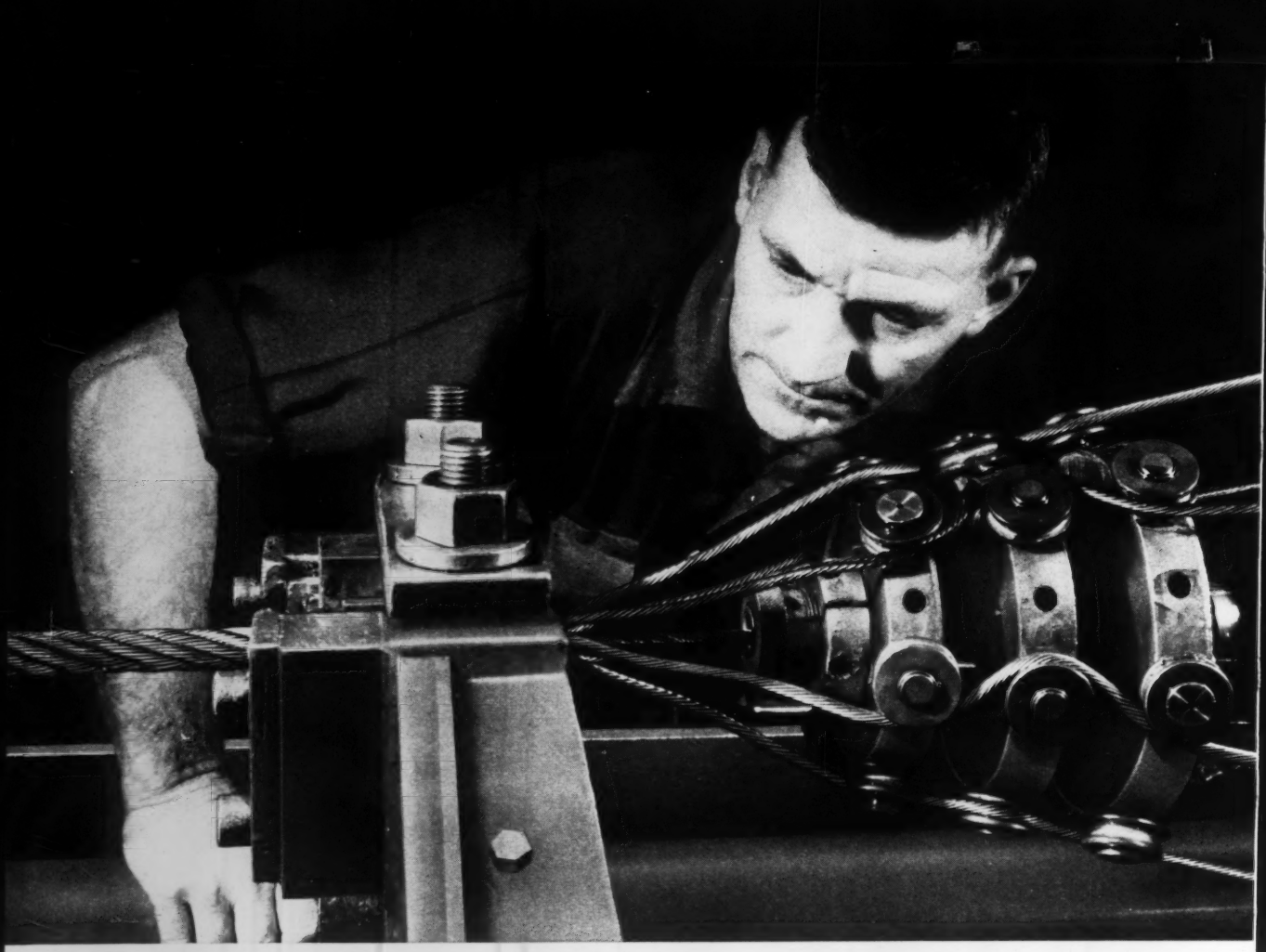


At the closing die on a wire rope closing machine, strands are pre-formed by rolls into the shape they will have in the finished rope. In the operation at right, strands are closed into finished rope.

Pittsburgh Steel Does A Job . . .

Where Wire Takes A Beating

Quality of Pittsburgh Wire in Rochester Ropes Protects Lives

Wire rope manufacturers just don't take chances on quality.

They can't afford to because their ropes have such vital jobs as protecting human lives and withstanding corrosive sea water for long periods.

The wire rope manufacturing process itself requires a wire of superior strength. Look at the photo above. Imagine the machine pictured is revolving at high speed as it preforms wire strands to a helical shape before the strands enter the closing die. In this process uniformity in the wire is essential to accurate preforming.

All requirements of rope makers for wire are exacting. You can be sure a wire mill which consistently meets those requirements is a good bet to produce other types of wire of high quality.

Go into the plant of one quality-conscious wire rope manufacturer—Rochester Ropes, Inc., of Culpeper, Va.—and you will see these requirements being met by wire from Pittsburgh Steel Co.

Even before manufacturing starts, Rochester Ropes, Inc., tests every coil of incoming wire to make sure the finished rope will give long service on tough jobs. Here's what the tests measure:

- **Torsion strength** which gives wire the ability to take repeated twisting action, both on the rope-making machines and in service.
- **Freedom from seams, inclusions and varying degrees of hardness** assures the wire rope user that no individual wires in the rope are likely to break under sudden or heavy strains.
- **Tensile strength** gives wire its work-horse qualities. The basic strength of wire rope comes from its tensile strength, the wire's ability to pick up a heavy load and to last for years in the field.
- **Zinc coatings** are tested to make sure the covering of protective metal is uniform and adequately thick. Wrapping tests make sure zinc won't flake off when a hawser scrapes against a wharf or that it won't peel when twisted around a stanchion.
- **Toughness** shows up better in the field than in the laboratory. Toughness is the quality which results from proper grain structure, from uniform dimensions which as-

(Advertisement)

Every coil of rope wire shown here before rewinding on bobbins for use on stranding machines is carefully tested. In the background are stranding and closing machines in the Rochester Ropes' plant.

sure even wear on the rope and from the skill with which wires are twisted into strands and strands into finished rope.

Finished wire rope undergoes another series of tests which make certain every coil of rope leaving the Rochester plant will do the specific job for which it was built.

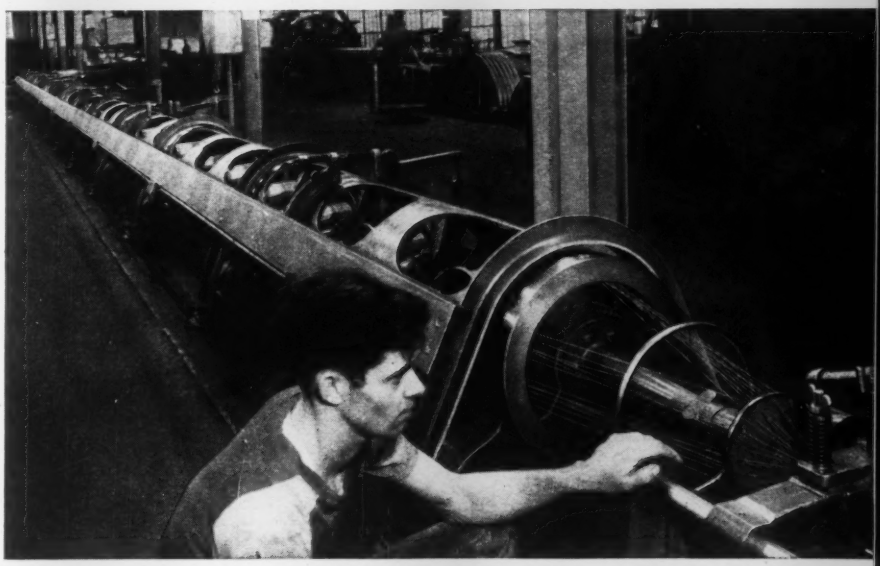
Pittsburgh Steel's rope wire, by making good in Rochester Ropes' laboratories, production machines and in the field, proves to all kinds of wire users that Pittsburgh Wire can be depended on for high, uniform quality.

"The quality of our wire rope starts with the wire we buy," said William L. Rochester, Jr., vice president in charge of sales at Rochester Ropes. "The quantity of rope wire we buy from Pittsburgh Steel speaks for the regard we have for its wire."

Whether you use oil tempered spring wire, aircraft wire, brush wire or any other kind of manufacturers' wire, you can enjoy the advantages that are built into rope wire.

Pittsburgh Steel wire will help you make a better product, lower operating costs and provide greater customer satisfaction.

Investigate these opportunities today. A telephone call to any of the district offices listed at right will bring skilled engineering help to you immediately.



Forty-one bobbins pay off wire on this 120-foot long stranding machine in the Culpeper, Va. plant of Rochester Ropes, Inc.

Pittsburgh Steel Company

Grant Building • Pittsburgh 30, Pa.

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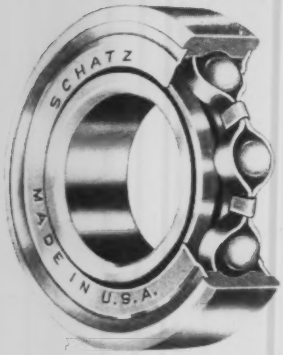
Schatz makes the most varied line of Ball Bearings to fit your needs



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23 sizes from $^{3}/_{16}$" to 1"—6 types in each size + specials

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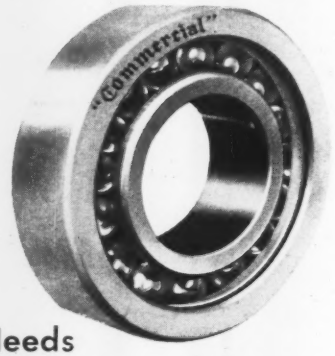
UNGROUND BALL BEARINGS "TYPE A"—Every standard type—radial, thrust and radial thrust.

GROUND BALL BEARINGS "TYPE B"—Used and recommended where greater accuracy and smoother running qualities are needed and where loads are heavier and speeds higher.



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We'll fit these bearings—or special types and sizes to your special needs. Just fill in your application problem below—attach to your letterhead and mail.

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Here's our bearing problem. What do you suggest?

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LOAD (radial, thrust or both)_____

SIZE_____

SPEED_____

LIFE FACTOR_____

OPERATING CONDITIONS_____

SPECIAL CONDITIONS_____

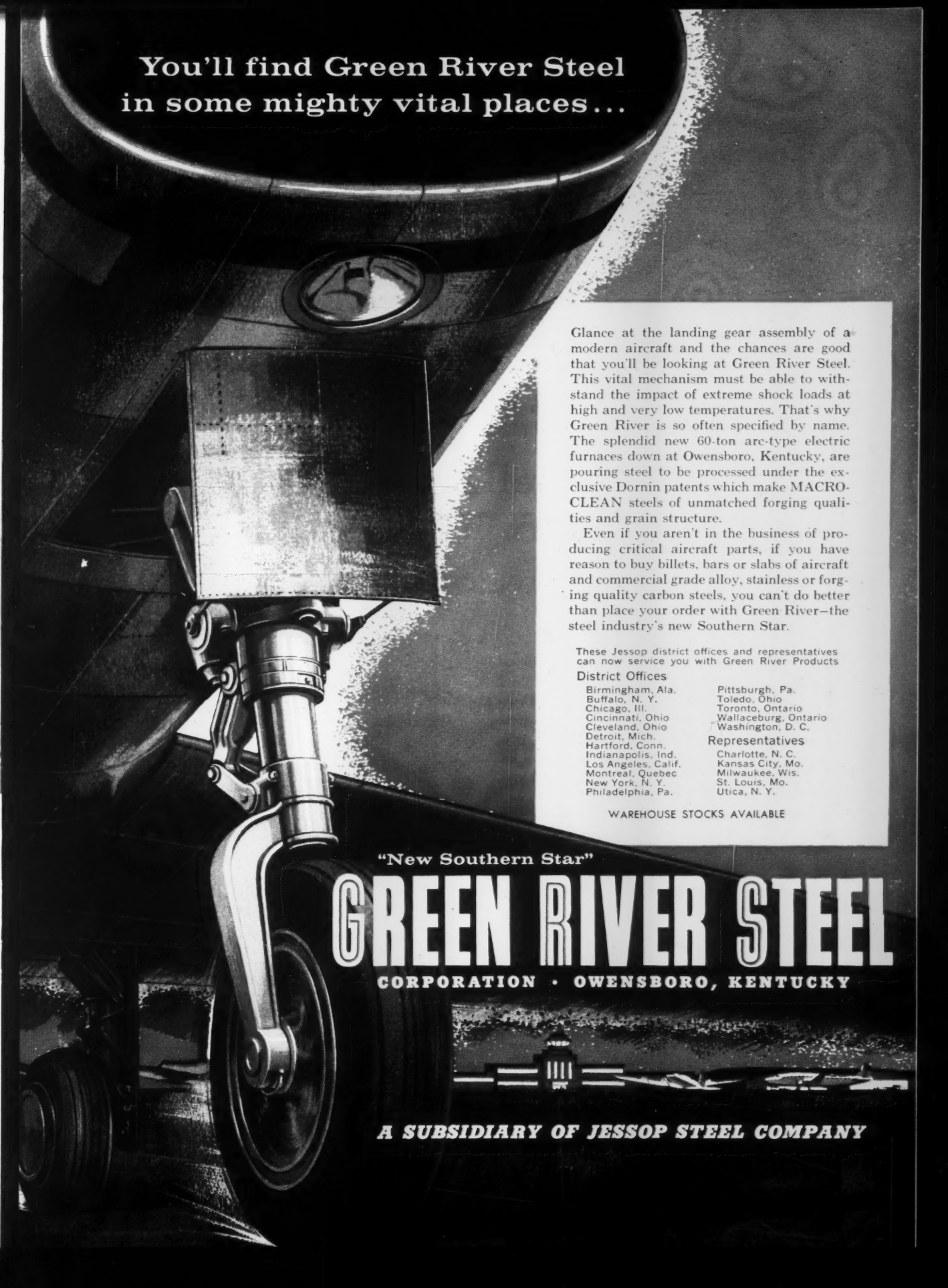
Name_____ Title_____

Company_____

Address_____

City_____ Zone_____ State_____

SCHATZ
BALL BEARINGS



Glance at the landing gear assembly of a modern aircraft and the chances are good that you'll be looking at Green River Steel. This vital mechanism must be able to withstand the impact of extreme shock loads at high and very low temperatures. That's why Green River is so often specified by name. The splendid new 60-ton arc-type electric furnaces down at Owensboro, Kentucky, are pouring steel to be processed under the exclusive Dornin patents which make MACRO-CLEAN steels of unmatched forging qualities and grain structure.

Even if you aren't in the business of producing critical aircraft parts, if you have reason to buy billets, bars or slabs of aircraft and commercial grade alloy, stainless or forging quality carbon steels, you can't do better than place your order with Green River—the steel industry's new Southern Star.

These Jessop district offices and representatives can now service you with Green River Products

District Offices

Birmingham, Ala.
Buffalo, N. Y.
Chicago, Ill.
Cincinnati, Ohio
Cleveland, Ohio
Detroit, Mich.
Hartford, Conn.
Indianapolis, Ind.
Los Angeles, Calif.
Montreal, Quebec
New York, N. Y.
Philadelphia, Pa.
Pittsburgh, Pa.
Toledo, Ohio
Toronto, Ontario
Wallaceburg, Ontario
Washington, D. C.

Representatives

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WAREHOUSE STOCKS AVAILABLE

"New Southern Star"

GREEN RIVER STEEL

CORPORATION · OWENSBORO, KENTUCKY

A SUBSIDIARY OF JESSOP STEEL COMPANY

This alloy "shopping list" saves many a day for busy metallurgists!

AISI		AMS			SAE	
302	410	5333	5376	5631	30302	51442
303	414	5334	5378	5640	30303	51446
304	416	5350	5380	5643	30303F	60303A
308	420	5351	5382	5645	30304	60304
309	430	5352	5385	5665	30310	60310
309 - W	430F	5354	5386	5700	30316	60316
310	431	5355	5388	5710	30321	60347
316	431A	5358	5389	5735	30347	60410
321	436	5360	5392	5765	51410	60420
327	440A	5361	5393	6270F	51414	60442
329	440B	5362	5394	6274F	51416F	60446
330	440C	5363	5526	6280C	51420	70310
331	440F	5366	5537	6350	51430	70310A
347	442	5369	5610E	6382	51431	70327
403	446	5370	5616	6428	51440A	70330
406		5372	5621	7834	51440B	70331
		5373	5628		51440C	70446
		5375	5630		51440F	

MISCELLANEOUS

Armco 17-4PH • GMR 235 • Inconel® • Invar • Monel® • NiResist® IA
NiResist® IIA • NiResist® III • Waspalloy

®International Nickel Co.

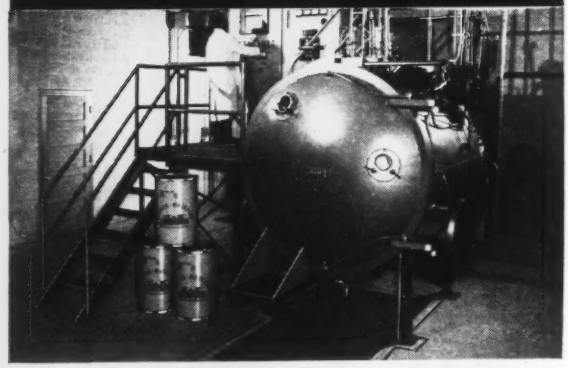
You name the alloy... we'll produce to your specs. —in record time!

THE watchword of CANNON-MUSKEGON is "CONTROL." Careful selection of the finest raw materials . . . rigid melting procedures . . . complete chemical and physical testing facilities, plus closely supervised handling — produce alloys to your most exacting standards. More than 100 special and standard alloy analyses are produced each year.

The alloy list above is typical of production "regulars" for scores of users in all industrial fields. If you don't see what you need — remember, our facilities are open to "tailor" alloys to your specific needs. We'll also recommend proper in-plant handling and heat treating procedures to assure the desired physical and chemical properties in your final product.

FOR IMMEDIATE REFERENCE — write for your personal copy of Cannon-Muskegon's 6-page handbook for metallurgists, giving you data on both UltraMet and MasterMet alloy service.

and CANNON-MUSKEGON offers you both vacuum and air-melting facilities for cobalt-, ferrous- and nickel-base alloys in a wide variety of cast forms



UltraMet alloys are produced in this latest design vacuum melting furnace — production center for a virtually unlimited variety of high temperature, corrosion resistant alloys for severe-stress applications.

ULTRA MET — VACUUM-MELTED ALLOYS FOR INDUSTRY

MASTER MET — CERTIFIED ALLOYS FOR INDUSTRY

CANNON-MUSKEGON CORPORATION

2893 Lincoln Avenue • Muskegon, Michigan, U.S.A.

METALLURGICAL SPECIALISTS

CALENDAR
OF MEETINGS

Mar. 9-11, American Machine Tool Distributors Association: Spring meeting, Roosevelt Hotel, New Orleans. Association's address: 1900 Arch St., Philadelphia 3, Pa. General manager: James C. Kelley.

Mar. 11-13, Instrument Society of America, Pittsburgh Section: Annual conference on instrumentation of the iron and steel industry, Roosevelt Hotel, Pittsburgh. Secretary: Frank K. Briggs, Atomic Power Div., Westinghouse Electric Corp., Large, Pa.

Mar. 12-14, Pressed Metal Institute: Annual spring technical meeting, Sheraton-Cadillac Hotel, Detroit. Institute's address: 3673 Lee Rd., Cleveland 20, Ohio. Managing director: Harold Daschner.

Mar. 15-18, National Association of Waste Material Dealers: Annual meeting, Waldorf-Astoria Hotel, New York. Association's address: 271 Madison Ave., New York 16, N. Y. Managing director: Clinton M. White.

Mar. 17-18, Steel Founders' Society of America: Annual meeting, Drake Hotel, Chicago. Society's address: 606 Terminal Tower, Cleveland 13, Ohio. Executive vice president: F. Kermit Donaldson.

Mar. 17-19, Atomic Industrial Forum Inc., and National Industrial Conference Board Inc.: Joint atomic energy management conference, Palmer House, Chicago. Information: AIF, 3 E. 54th St., New York 22, N. Y., or NICB, 460 Park Ave., New York 22, N. Y.

Mar. 17-20, American Society of Mechanical Engineers: Aviation division conference, Statler-Hilton Hotel, Dallas. Society's address: 29 W. 39th St., New York 18, N. Y. Secretary: C. E. Davies.

Mar. 17-21, National Association of Corrosion Engineers: Annual conference and exhibition, Civic Auditorium, San Francisco. Association's address: 1061 M & M Bldg., Houston 2, Tex. Executive secretary: A. B. Campbell.

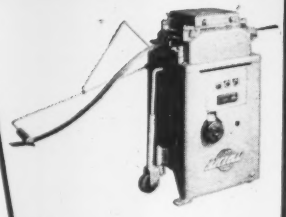
Mar. 17-21, Nuclear Congress and Atomic Industry Trade Show: International Amphitheatre, Chicago. Information: International Atomic Exposition Inc., 12 S. 12th St., Philadelphia 7, Pa.

Mar. 19-21, American Management Association: Special conference on product development, LaSalle Hotel, Chicago. Association's address: 1515 Broadway, New York 36, N. Y. President: Lawrence A. Appley.

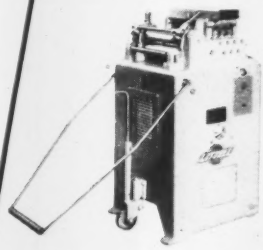
Mar. 19-21, Electronic Industries Association: Spring meeting, Statler Hotel, Washington. Association's address: 1721 DeSales St. N.W., Washington 6, D. C. Secretary: James D. Secrest.

Mar. 19-21, International Acetylene Association: Annual convention, Bellevue-Stratford Hotel, Philadelphia. Association's address: 205 E. 42nd St., New York 17, N. Y. Secretary: H. F. Reinhard.

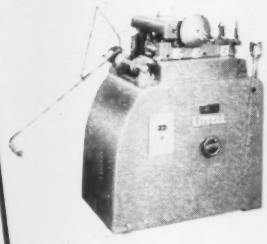
LITTELL STRAIGHTENERS



No. 208 STRAIGHTENER
For stock .010" to .040" thick and up to 8" wide. Also straightens stamped parts.



No. 308 STRAIGHTENER
For stock .018" to .065" thick and .018" to .050" thick, up to 12" wide.



No. 412-5PD STRAIGHTENER
For heavier stock from .040" to .125" thick by 12" wide.

FOR
AUTOMATED
COIL STOCK STRAIGHTENING AT ANY SPEED YOUR PRESS REQUIRES

STANDARD LITTELL STRAIGHTENERS with Variable Speed Drive straighten stock at any speed from 10 to 60 feet per minute. Proper slack in straightened stock between straightener rolls and press is automatically maintained by the Arm Control's up and down action which starts and stops the straightener motor.

ELECTRIC CLUTCH and BRAKE LITTELL STRAIGHTENERS provide for high speed intermittent straightening action with no motor stop. Ideal for hump feeding.

OIL GEAR DRIVE LITTELL STRAIGHTENERS have a straightening speed range of 0 to 60 feet per minute. Ideal for intermittent feeding of long stock lengths.

FAST DELIVERIES
from complete stocks in the newly enlarged Littell plant.

LOOK TO LITTELL FOR ROLL FEEDS • SHEETING LINES STRAIGHTENING AND FEEDING MACHINES REELS AND CRADLES FOR COIL STOCK

USE THIS COUPON
TO GET FREE CATALOGS.

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District Offices: Detroit, Cleveland

F. J. Littell Machine Co., 4189 Ravenswood, Chicago 13, Ill.
Send Littell Straightener Catalogs "C"

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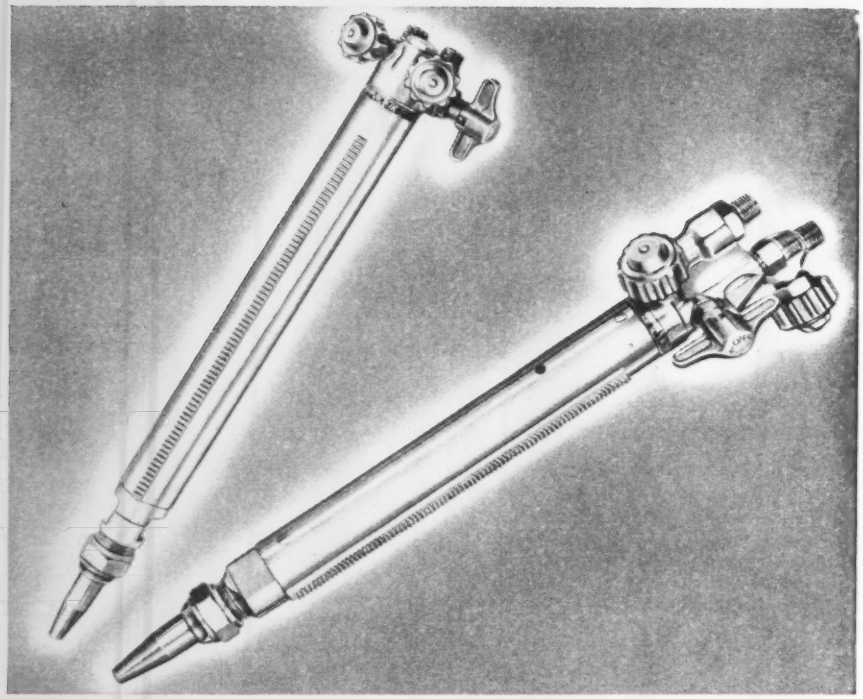

NEW

VICTOR

MACHINE CUTTING TORCHES

Two Hose Type

MT-200 SERIES for medium pressure acetylene.

MT-200 LPCG SERIES for low or medium pressure fuel gases such as city, natural or petroleum gases.

Three Hose Type

MT-300A SERIES for medium pressure acetylene.

MT-300A LPCG SERIES for low or medium pressure fuel gases such as city, natural or petroleum gases.

Designed for general purpose machine cutting. All commercial fuel gases commonly used for machine cutting can be utilized by selection of the proper size and type of Victor cutting tips and torch model.

These New Victor machine cutting torches feature—

Stainless steel mixing chamber.

Time-tested Victor Spiral Mixer for maximum efficiency and heat resistance.

Convenient control valves for ease of operation.

Popular quick-acting cutting oxygen valve with long life "O" ring packing.

Preheat gas valves with stainless steel ball points and special packing design to hold valve adjustments steady.

For model, type and size best fitted to your needs, call your VICTOR dealer . . . or write us for descriptive bulletins.

VICTOR for welding

VICTOR EQUIPMENT COMPANY

Mfrs. of welding & cutting equipment; hardfacing rods, blasting nozzles; cobalt & tungsten castings; straightline and shape cutting machines.

41

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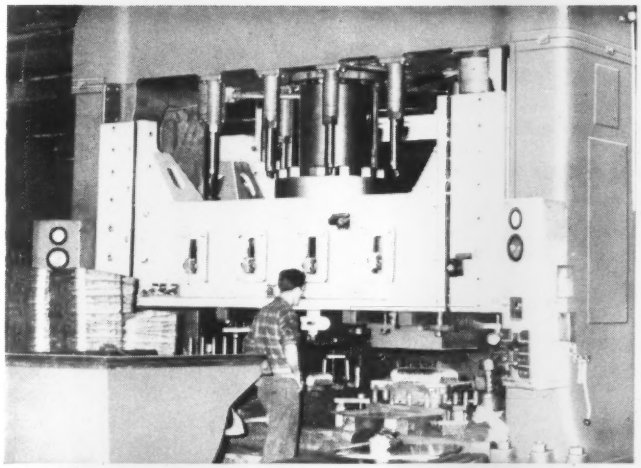
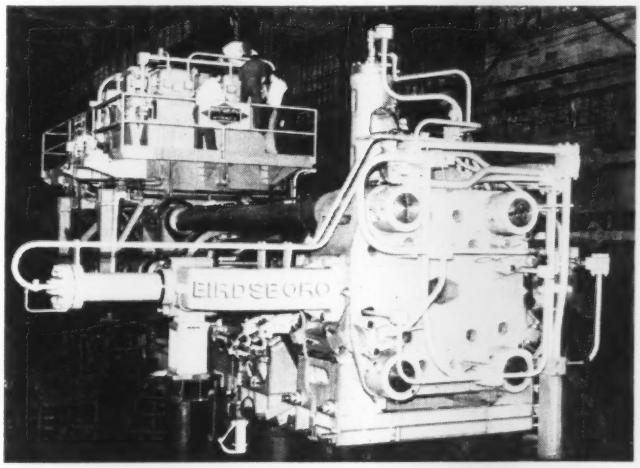
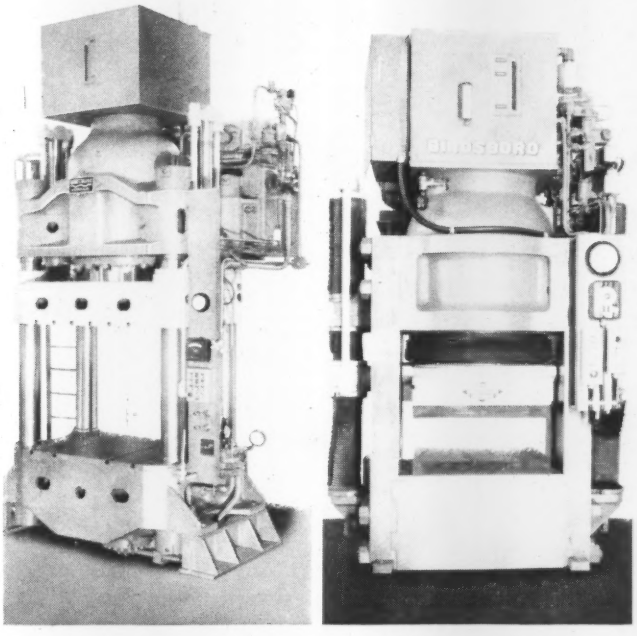






new

Hydraulic Press design advances are produced consistently by BIRDSBORO experience

With any type of press job, Birdsboro has the engineering know-how and production experience to give you a customized job. From a wealth of background comes new design features in which Birdsboro engineers take pride. These are features that make possible new production savings in time and cost and insure product quality. A Birdsboro representative can bring you up to date on the latest developments. *Main Office, Engineering Department and Plant:* Birdsboro, Pa., *District Office:* Pittsburgh, Pa.

BIRDSBORO HYDRAULIC

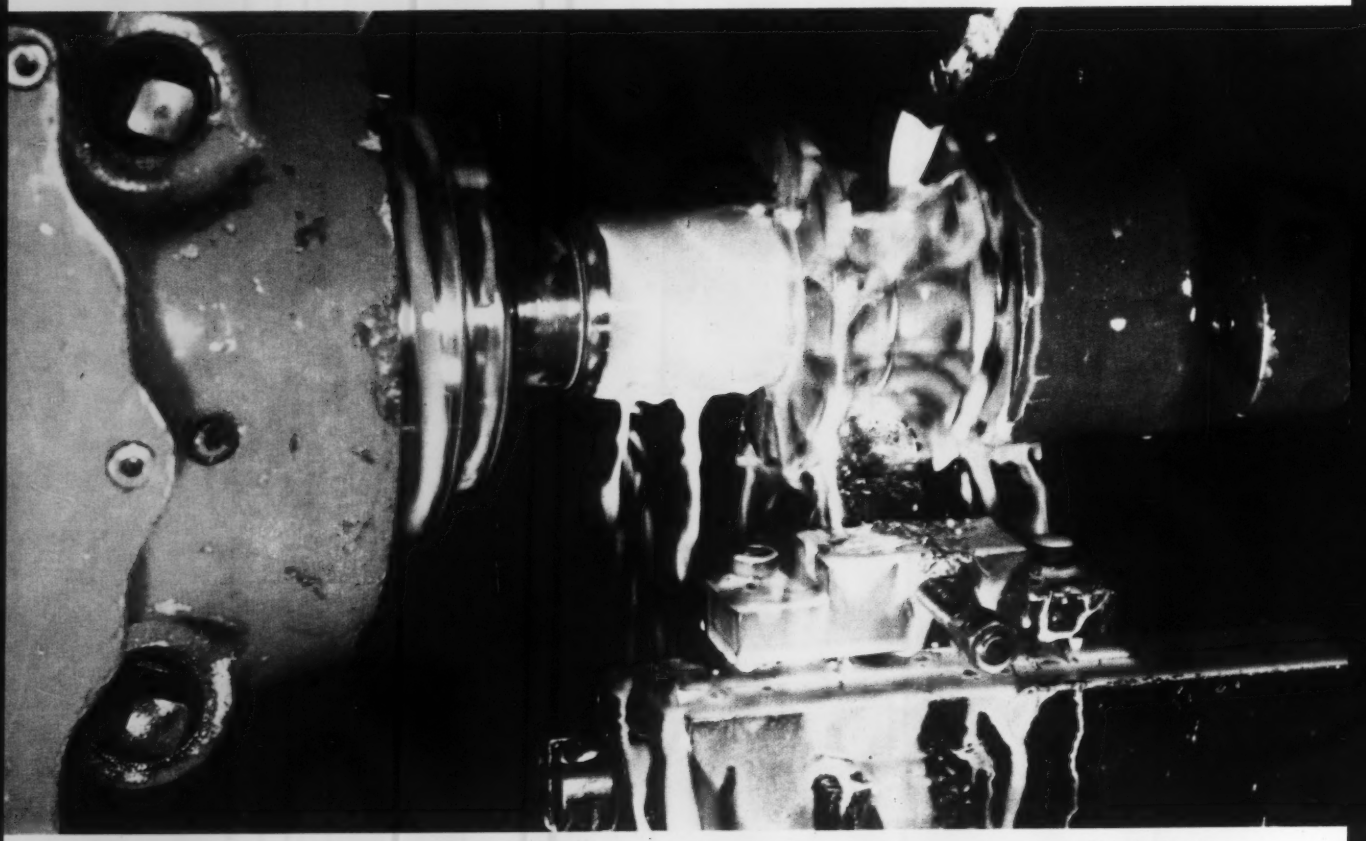
HP-33-18

BIRDSBORO

STEEL FOUNDRY AND MACHINE CO.

STEEL MILL MACHINERY • HYDRAULIC PRESSES • CRUSHING MACHINERY • SPECIAL MACHINERY • STEEL CASTINGS • Weldments "CAST-WELD" Design • ROLLS: Steel, Alloy Iron, Alloy Steel

Wheels and machines stay cleaner with emulsions of new S.E.C.O. Also, finishes are better.



Emulsions of new S.E.C.O. allow faster cuts with less tool wear.

Photos courtesy of
Peter Salmon Co., Glenside, Pa.

NEW EMULSIFYING OIL KEEPS MACHINES CLEAN, PROTECTS AGAINST RUST, GIVES IMPROVED HARD-WATER EMULSION STABILITY

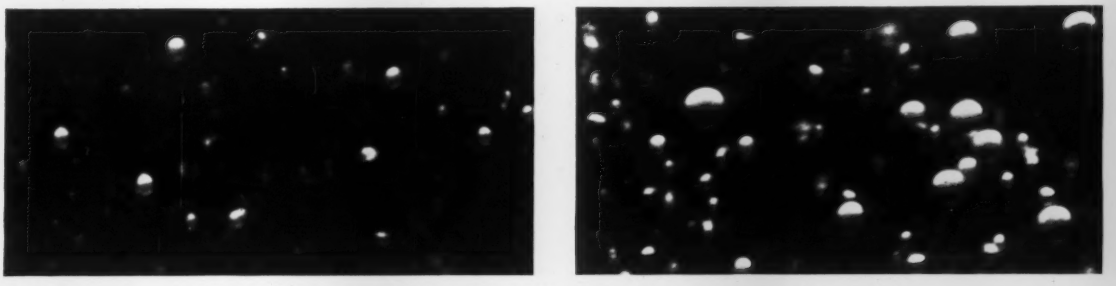
Emulsions of Sun's new S.E.C.O. (Sunoco® Emulsifying Cutting Oil) with smaller oil particle size give you the following benefits—

EMULSION STABILITY—In hard-water areas, impartial field tests show that emulsions of *new* S.E.C.O. stand up better under more severe conditions than those made with other regular emulsifying cutting oils.

DETERGENCY—The excellent wetting properties and detergency of *new* S.E.C.O. allow dirt and fines to settle quickly out of emulsions. Grinding wheels and machines stay cleaner.

RUST-PREVENTION—The smaller oil particle size in emulsions of *new* S.E.C.O. gives better metal wetting properties and increased protection against rust and corrosion. See photos below.

If you're a regular user of S.E.C.O., notice how much it has been improved. If you're not, find out what we mean about greater economy and improved production with *new* Sunoco Emulsifying Cutting Oil. Call your Sun representative, or write to Sun Oil Company, Philadelphia 3, Pa., Dept. I-9.



800x photomicrographs of 10% emulsions. *New* S.E.C.O. emulsion on left contains *8 times* as many oil particles per unit volume as ordinary emulsion on right. Many minute particles in S.E.C.O. emulsion do not show at this magnification.

SUNOCO®

INDUSTRIAL PRODUCTS DEPARTMENT

SUN OIL COMPANY Philadelphia 3, Pa.

IN CANADA: SUN OIL COMPANY LIMITED, TORONTO AND MONTREAL

©Sun Oil Co., 1958

You can SEE THE DIFFERENCE

. . . in "LUSTERIZED FINISH"
because it is . . .

- BRIGHTER
- CLEANER
- SMOOTH
- UNIFORM

You can **see** the difference, and you can **sense** the difference in your manufacturing economy when you change over to Bliss & Laughlin's new "Lusterized" Cold Drawn Bar Steel.

It automatically provides a brighter finish to fabricated parts on areas where you do not remove stock.

It is cleaner to handle . . . not so messy for men or machines to work with. It has an inherently smooth cold drawn surface for superior quality machine parts.

Its consistent uniformity, bar to bar, means improved machining efficiency . . . less stock waste.

This modern Cold Drawn Finish has become a real factor in reducing production costs. Specify B&L Lusterized Finish on your next order.

LUSTERIZED FINISH
TRADE-MARK REGISTERED

LUSTERIZED NON-LUSTERIZED

For further facts on Lusterized Finish, write for Bulletin #55.

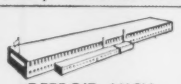
BLISS & LAUGHLIN, INC.

SALES OFFICES IN ALL PRINCIPAL CITIES

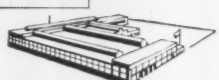
GENERAL OFFICES: HARVEY, ILLINOIS

FOUR PLANTS:—

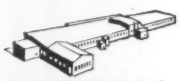
HARVEY, ILL.



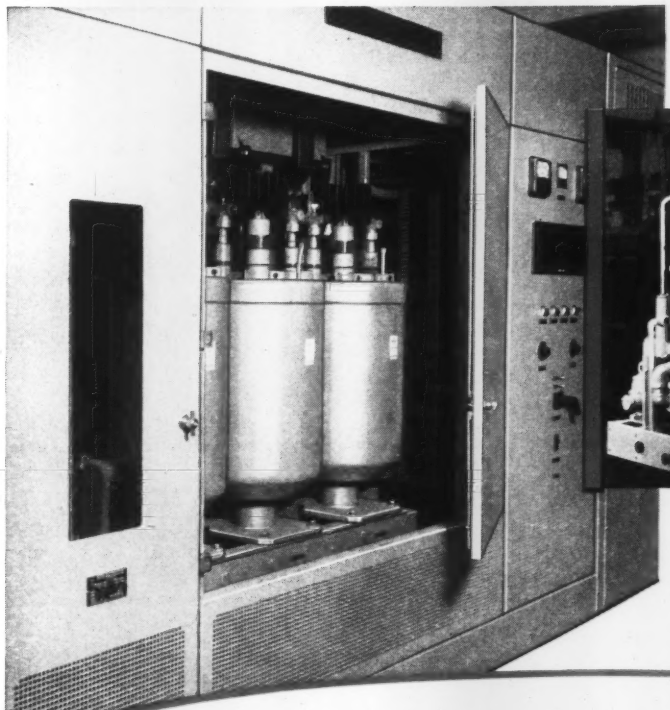
DETROIT, MICH.



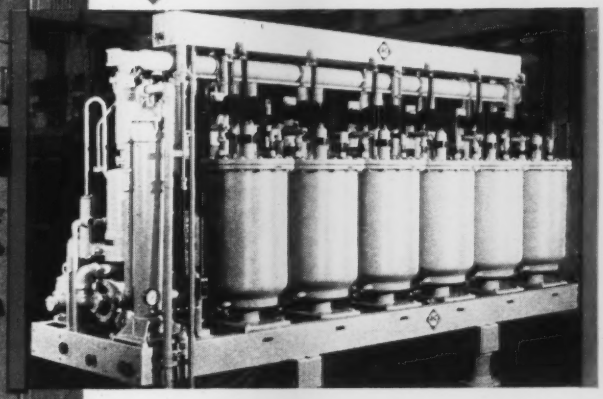
BUFFALO, N. Y.



MANSFIELD, MASS.



Open pumped tube unit permits easy access for inspection. Easy to recondition in field.



Enclosed sealed tube unit conserves space, cuts installation costs, eliminates need for vacuum pumping system.

ALLIS-CHALMERS

Mercury Arc Rectifiers

Pumped or Sealed? Open or Enclosed?

Here's how Allis-Chalmers can help you choose a rectifier for your job—

BOTH sealed and pump-evacuated tube rectifiers offer distinct advantages, depending upon the application. Whether your rectifier should be open or enclosed construction also depends on the application. Since Allis-Chalmers offers you a choice of sealed or pumped tubes in either open or enclosed construction, you get an unbiased recommendation, based on a study of your needs, and not on commercial expediency. And you can be sure of unsurpassed reliability and ease of operation, as proved in hundreds of Allis-Chalmers installations.

Only Allis-Chalmers Excitron Rectifiers give you all these important advantages—

- **Fixed excitation anode** does not contact mercury — is independent of level, turbulence or impurities.
- **Continuous excitation** eliminates need for reignition — pilot arc always present.
- **Grid phase control** located in clean region near anode where ion density is lowest.
- **Internal cooling system** provides high heat transfer with seamless tube coil.
- **Arc-over-free tube** eliminates arc-over danger by insulating entire arc path.
- **Enameled anode seals** provide high strength, trouble-free seal.

For detailed information on mercury arc rectifiers contact your nearest A-C office, or write Allis-Chalmers, Industrial Equipment Division, Milwaukee 1, Wisconsin, for bulletin 12B8494.

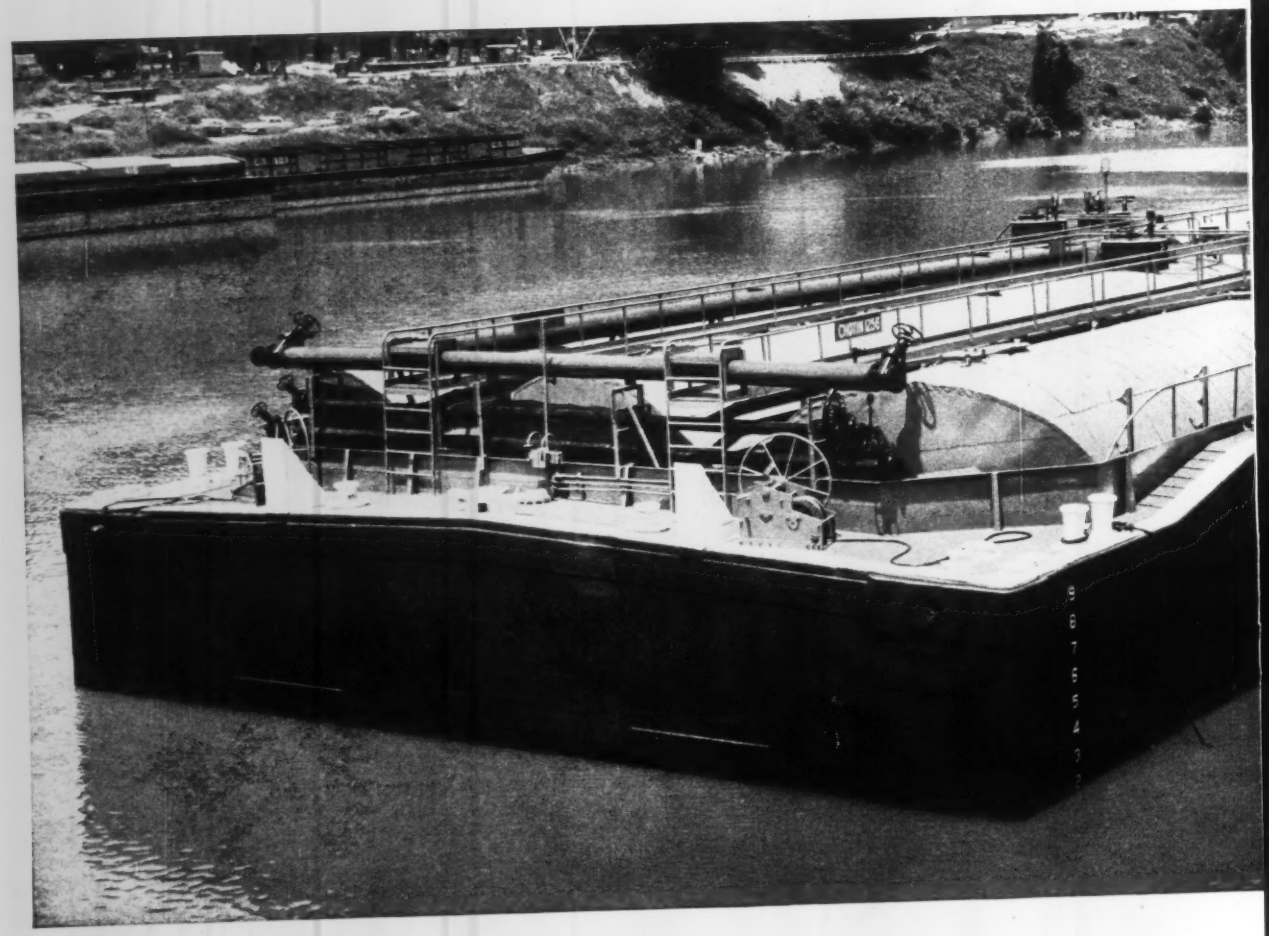
ALLIS-CHALMERS

A-C ALLIS-CHALMERS

A-5560

For whatever you make . . .

N-A-X® HIGH-TENSILE STEEL MEANS LIGHTER WEIGHT WITH LONGER LIFE



Light weight and shallow draft make the ideal commercial river barge. Thanks to the inherent qualities of N-A-X HIGH-TENSILE steel, this river barge designed and built by Nashville Bridge Company, Nashville, Tennessee, offers a weight reduction in excess of 10% over mild carbon steel—plus longer life and increased payload capacity with shallower draft.

Operators like the way weight-saving N-A-X HIGH-TENSILE improves barge towing efficiency—less draft when loaded; less dead weight to pull when empty. That means savings on operating costs all the time. And, again thanks to N-A-X HIGH-TENSILE, barge operators get more resistance to corrosion. For this manufacturing job, like so many others, N-A-X HIGH-TENSILE steel provides desirable lightness with greater durability and strength.

Check These Important Advantages for Your Job: The N-A-X HIGH-STRENGTH steels—both N-A-X HIGH-TENSILE and N-A-X FINEGRAIN—compared with carbon steel, are 50% stronger • have high fatigue life with great toughness • are cold formed readily into difficult stampings • are stable against aging • have greater resistance to abrasion • are readily welded by any process • offer greater paint adhesion • polish to a high luster at minimum cost.

Although N-A-X FINEGRAIN'S resistance to normal atmospheric corrosion is twice that of carbon steel, N-A-X HIGH-TENSILE is recommended where resistance to extreme atmospheric corrosion is important.

For whatever you make, from steel shop boxes to steel river barges, with N-A-X HIGH-STRENGTH steels you can design longer life, and/or less weight and economy into your products. Let us show you how.

This barge, built by Nashville Bridge Company, hauls hot asphalt between Baton Rouge and other points along the Mississippi-Ohio River system. Both the barge hull and the cargo tanks are made of N-A-X HIGH-TENSILE. Weight reduction: in excess of 10% compared with mild carbon steel.

N-A-X
HIGH-STRENGTH STEELS

N-A-X Alloy Sales Division, Dept. B-2

GREAT LAKES STEEL CORPORATION

Detroit 29, Michigan • Division of

NATIONAL STEEL CORPORATION

N-A-X Alloy Sales Div., Dept. B-2
Great Lakes Steel Corp., Detroit 29, Michigan

☐ Please send me 12-page illustrated technical catalog on N-A-X HIGH-STRENGTH steels.

☐ Please have your representative contact me.

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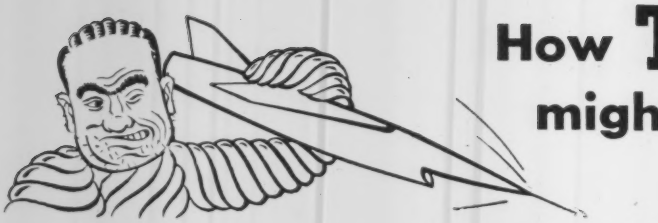
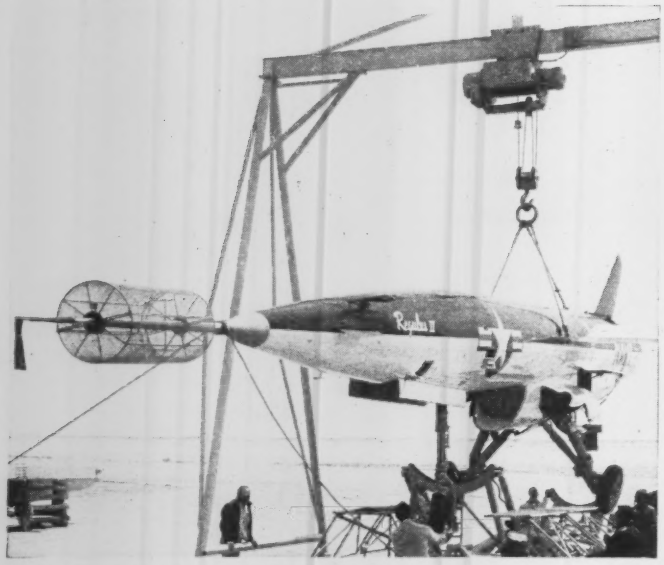
City _____ Zone ____ State _____

How Tuffy Slings move mighty Regulus Missiles





Regulus II gets a lift with Tuffy Slings. This long-range supersonic jet-powered missile is designed for launching from submarines, aircraft carriers; cruisers and shore bases. Test and training versions are equipped with landing gear so they may be recovered after each flight saving taxpayers millions of dollars.

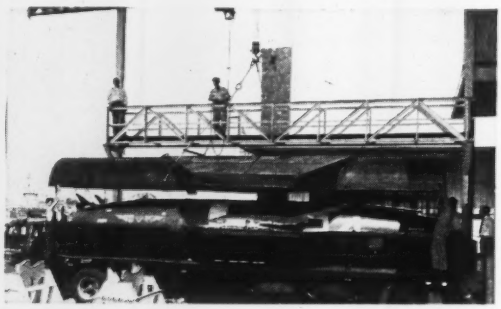
America's intercontinental ballistic missile is still in the future, but the U. S. Navy has intercontinental assault capability today in the combination of submarine and the Regulus I and II guided missiles.

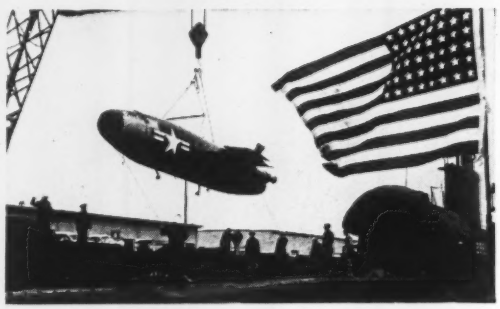
The Chance Vought Regulus I is a fully operational missile that can deliver an atomic warhead more than 500 miles, anywhere in the world. The Regulus II, soon to be operational, has already flown at supersonic speeds and altitudes of more than 50,000 feet.

As the pictures here show, Tuffy Slings are entrusted with the handling of these mighty missiles. Tuffy Slings are used all along the line of production and delivery.

The same combination of strength and flexibility that made Tuffy Slings the choice for this momentous job is yours in Tuffy Slings for every sling use. You get the same machine-braided fabric that resists kinking and from which kinks that do occur are easily removed without material damage. You get the same Tuffy pressed-on ferrule that gives the eye-splice 100% the strength of the fabric. For longer sling life, greater efficiency and safety, get in touch with your Tuffy distributor.

Tuffy helps "can" a missile: Regulus I is shown here being loaded into shipping can with Tuffy Slings. The weight of the missile is classified, but we can say that the weight of the shipping can lid, shown in lower picture, is 3,500 lbs.





Lowering Regulus I onto a submarine, Tuffy Slings are again part of the picture. The fact that such a valuable and vital weapon is entrusted to Tuffy Slings is one of the finest testimonials to Tuffy quality, dependability and safety.

Write today for your copy of
FREE TUFFY SLING HANDBOOK
Full sling data and specifications plus complete rigger's handbook.

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SUBSIDIARY ARMCO STEEL CORPORATION
2160 Manchester Ave. **Kansas City 26, Missouri**
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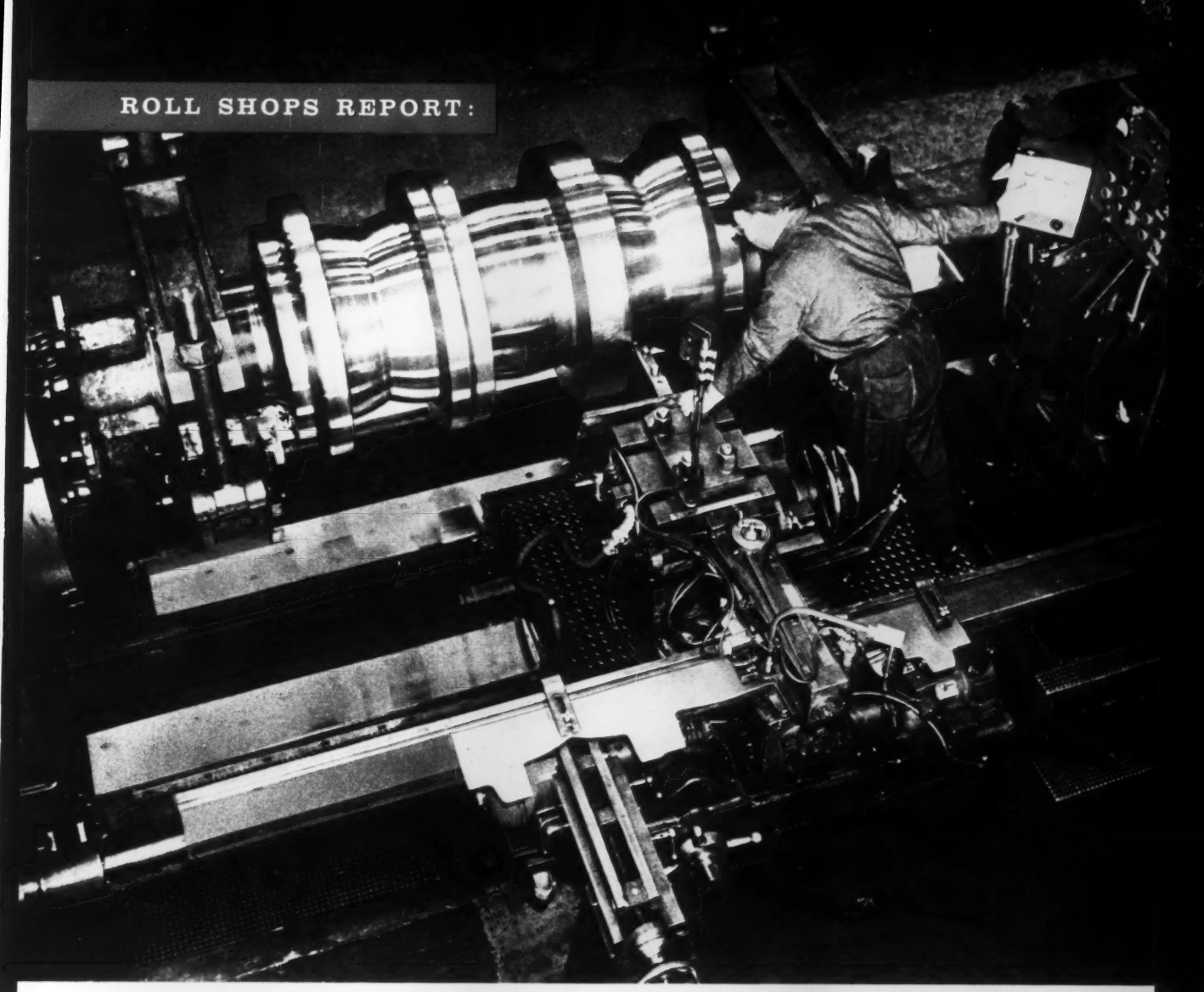

"The skill's built in...and it does the work of three!"

What are your most urgent roll problems? A growing work load...high roll turning costs . . . a shrinking supply of skilled roll turners? *If that's the case, you're no different from 90 per cent of steel mill roll shops.*

Mack-Hemp Automatic Contouring lathes solve these problems for you. They reduce turning time by taking off more metal in one hour than a roll turner can in three or four on a block lathe. Yet Mack-Hemp lathes accurately reproduce within 0.001-inch complicated roll patterns from ful-size templates by means of an electronic "pilot."

That's why many leading steel mill roll shops are using Mack-Hemp contouring lathes and why a number of others have ordered them.

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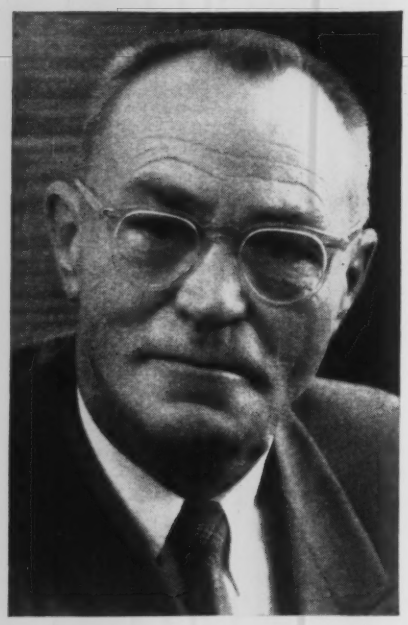
"U.S. Steel Supply Special Services help us CUT PRODUCTION COSTS"

says

W. J. Pitter
President
Pitter Metal Products, Inc.
Maywood, California



• "U. S. Steel Supply pre-cuts sheets to any size we want," says Mr. W. J. Pitter, president, Pitter Metal Products, Inc., sheet metal fabricators, Maywood, California.

"We take advantage of U. S. Steel Supply Special Services by ordering our sheets pre-cut. Thus, we eliminate not only profit-robbing delays caused by cutting the sheets ourselves, but also the risk of costly cutting errors. Our labor costs are reduced, and we have no waste or storage problems with pre-cut sheets. The price differential is *more* than offset by the speed, variety and technical assistance given by U. S. Steel Supply Special Services."

Steel buyers, like W. J. Pitter, know from experience the value of these dependable services.

Why not put these Special Services to work for you?

You can use U. S. Steel Supply's flame-cutting, shearing, slitting or coiling equipment, and eliminate the need for this expensive machinery in your plant. If you would like one of our representatives to show you how to benefit from U. S. Steel Supply Special Services, write to U. S. Steel Supply at the address listed below.

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DIVISION

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P. O. Box 1099, Dept. D3, Chicago 90, Ill.

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UNITED STATES STEEL

12 Ton Plymouth Locomotive operates 24 hours daily over 10 mile track system at this modern steel mill

PLYMOUTH lowers production costs by keeping steel in process on the move!

You get the reliability that returns greater profits when you put a Plymouth Locomotive to work—and the more continuous usage you give it, the more you benefit. There are many good reasons for that.

Plymouth Locomotives are built to handle big jobs with speed and efficiency around the clock—in all kinds of weather. Instant availability, low maintenance requirements, and faster switching, spotting and hauling performance reduces costs all around. Smooth starts and ease of control make Plymouth popular with the operators, reduce fatigue, and keep efficiency high.

We make both gasoline and Diesel Locomotives from 3 to 80 tons—either mechanical or Torqomotive (hydraulic torque-converter) drive—there's a Plymouth Locomotive that will fit your requirements perfectly.

"Saving time and money with our Torqomotive," says this user.

Within a few months after the Plymouth Diesel Torqomotive shown above was delivered, this Eastern steel manufacturer knew they had an outstanding locomotive. "Too early for actual cost figures," was the report, "but haulage by Plymouth is superior to previous methods. Our operator likes it better, too."

Send us a brief outline of your operation and we'll send you a recommendation promptly. Address: Plymouth Locomotive Works, The Fate-Root-Heath Company, Dept. A-1, Plymouth, Ohio.

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WITH TORQOMOTIVE DRIVE

RAIL POWER

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in PROGRESSIVE INDUSTRY
throughout the WORLD

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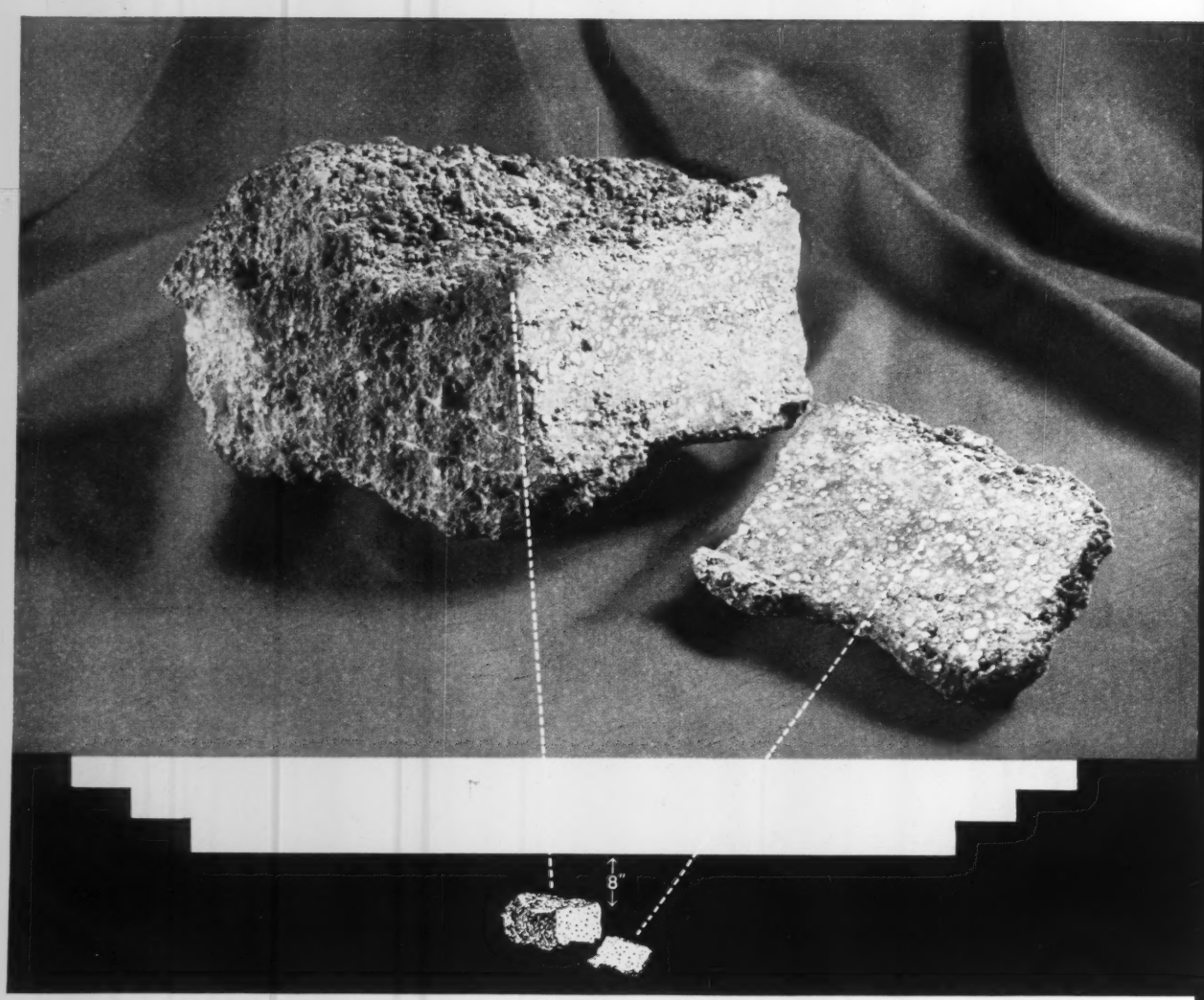
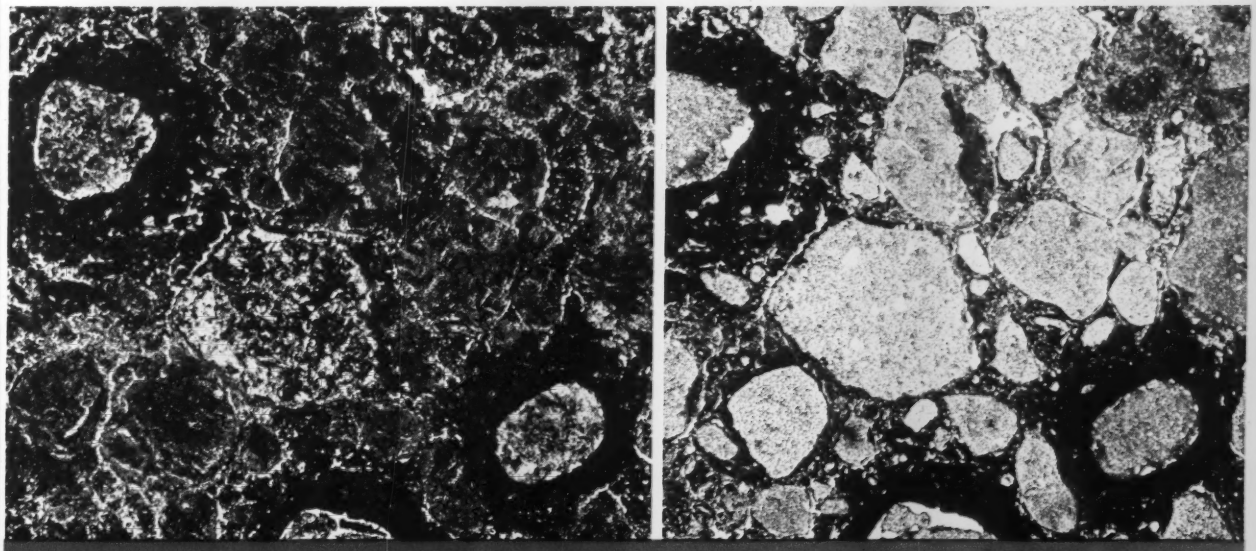
Permanente 165 Bottom as tough as new after 3½ years service



Unretouched photograph of actual specimens taken from 8 inches below working surface of Open Hearth bottom at center of furnace opposite #2 door. Furnace has 265 ton capacity and an operating rate of 10 hours and 45 minutes. 587,010 tons of regular carbon steel were tapped on this bottom.



These photomicrographs (enlarged 15 times) were taken from a thin section and show the mineralogical and textural characteristics typical of the complete specimen.

The coarser grains show no signs of having been altered or corroded during the 3½ years service period. The bond between coarser grain and matrix appears strong.

The fine matrix portion, although penetrated by calcium, has not been deteriorated. In fact, the filling of voids by calcium components tends to inhibit penetration of possibly more corrosive materials.

These specimens of Permanente 165 Ramming Mix were taken from eight inches below the rammed working surface of an Open Hearth furnace at a major steel plant. They were then submitted to Kaiser Chemicals research laboratories for chemical analysis and petrographic examination.

Here, briefly, are the findings of the laboratory tests:

1. The specimens are in excellent condition, with the components firmly bonded together.

2. Except for minor amounts of calcium and traces of other compounds, the specimens have not been significantly penetrated or contaminated by components of furnace charge or slag.

CHEMICAL ANALYSIS:

The results of the chemical analysis of the specimen are tabulated below:

Moisture loss (110°C for 2 hours)	0.24
Ignition loss (1000°C for 1 hour on dried sample)	0.92

	Analysis on Dried Basis	Typical Analysis
SiO_2	3.02	2.4
Cr_2O_3	0.94	1.0
Fe_2O_3	0.70	0.6
Al_2O_3	0.58	0.3
CaO	7.42	1.1
MgO (by diff.)	87.34	94.6
Na_2O	trace	
SO_3	trace	

These tests confirm once again the reasons why Permanente 165 Ramming Mix lasts longer than other materials . . . requires fewer repairs and less down time . . . helps produce greater tonnage at lower bottom cost.

Permanente 165 is made from high purity Kaiser Periclase refractory grains (94-96% MgO), and ceramically bonds itself into a crystalline mass at relatively low temperatures. This produces a bottom with maximum resistance to hydration and attack by iron oxide and slag. Its installed high density—averaging 175 pounds per cubic foot—assures longer life.

Why not ask your Kaiser Chemicals Sales Engineer to show you how this superior ramming mix can help you get greater steel tonnage at lower bottom cost?

Call or write Kaiser Chemicals Division, Dept. R-8221, Kaiser Aluminum & Chemical Sales, Inc., at any of the regional offices listed below:

PITTSBURGH 22, PA. . . . 3 Gateway Center
HAMMOND, IND. . . . 518 Calumet Building
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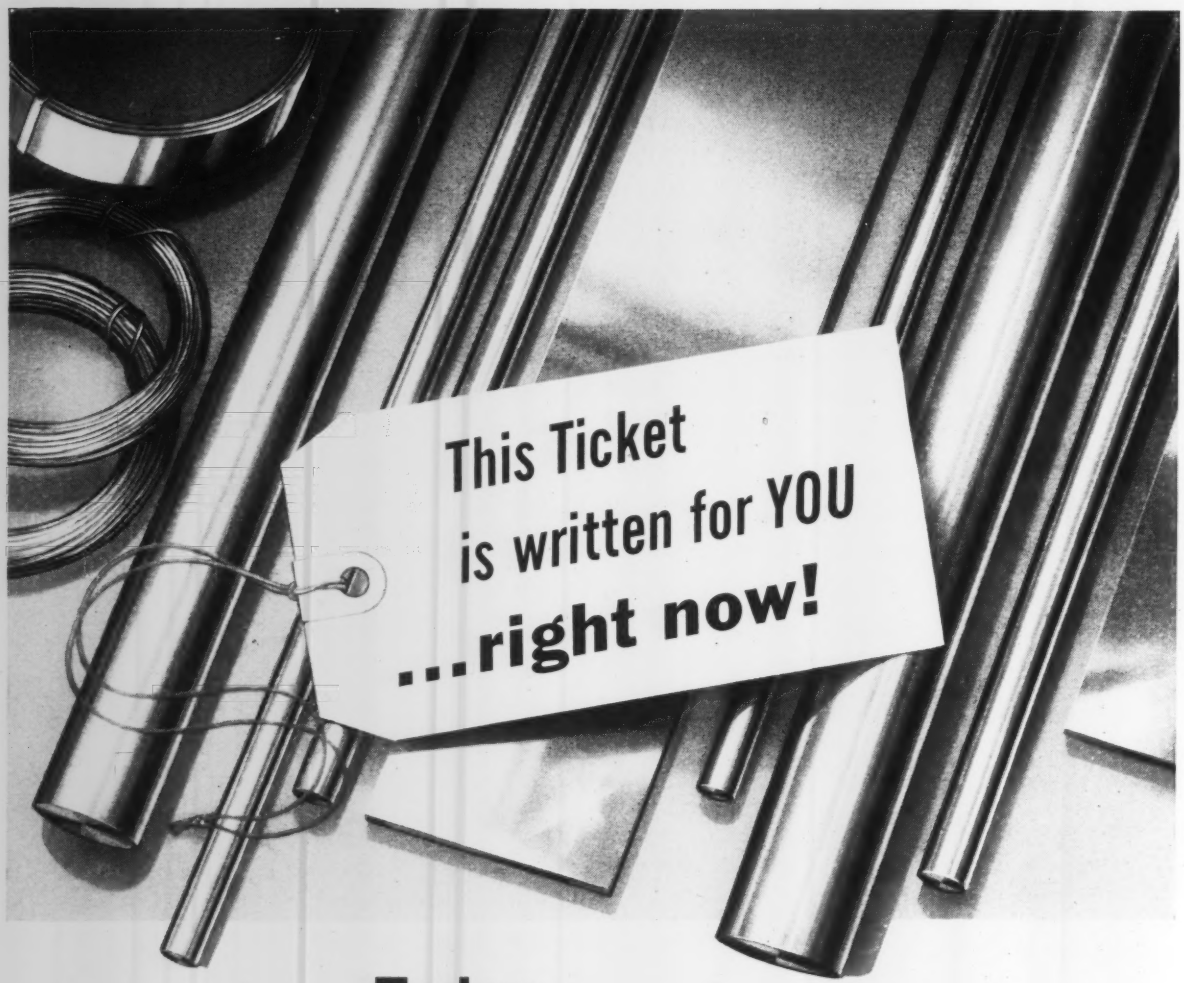

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And let *Bristol* Brass bring into your profit-picture the "custom-fitted" alloy that will do your product most proudly. *Now*, more than ever, it's good business to buy Bristol Brass strip, rod and wire. Call Ludlow 2-3161 and ask for a sales engineer.

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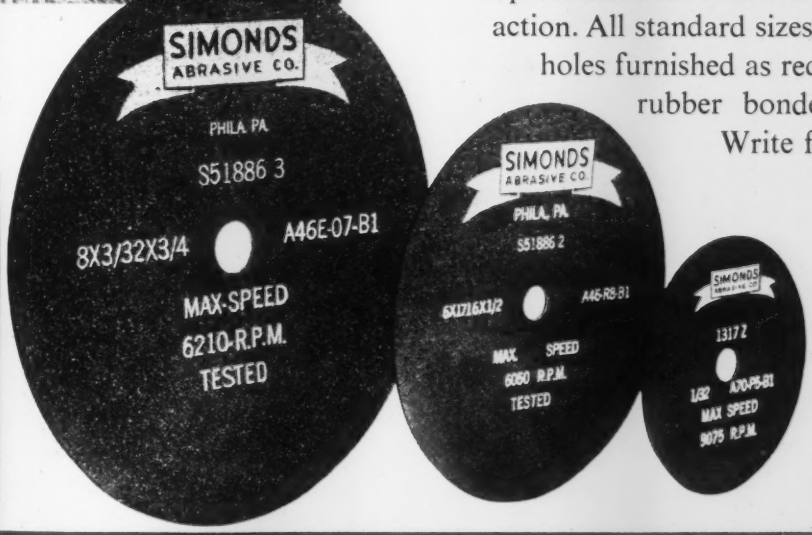
Resinoid bonded to stand up to the rigors of high-speed grinding! Rubber bonded for wet or dry cutting under severe-stress and strain! Simonds cut-off wheels, in either bond, save time, money and materials with speedy, accurate cutting. You can also eliminate finishing operations due to their clean-cutting action. All standard sizes. Drive pin holes furnished as required with rubber bonded wheels. Write for bulletin ESA 163.

For all metals, including hard alloys, and non-metals except wood.



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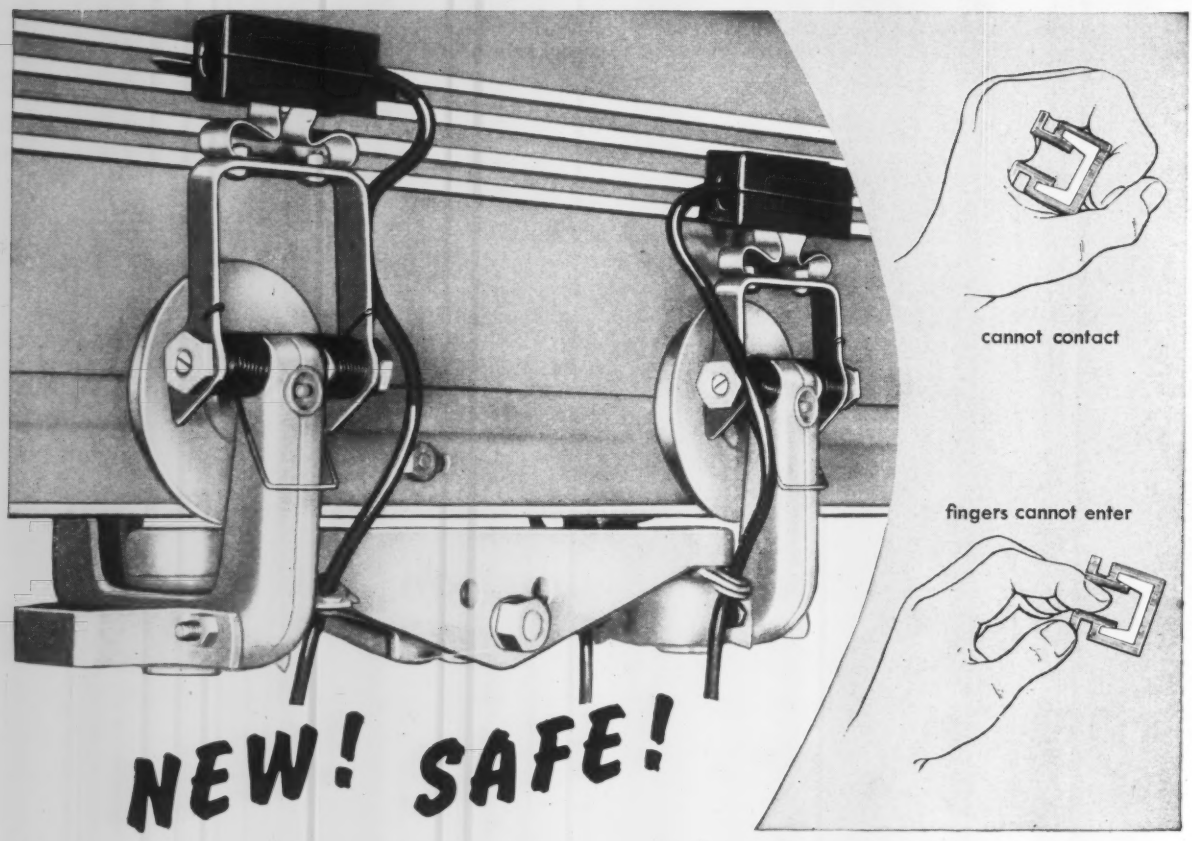

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SHIELDED ELECTRIFICATION

For Monorail Track and Crane Systems

By covering its standard bus bar electrification with a specially designed polyvinyl chloride extrusion, American MonoRail now furnishes completely safe electrified systems.

This KANT-SHOCK shielding absolutely prevents accidental contact with live bus bars. It is impossible for an adult's finger to enter the shield.

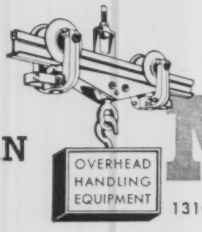
A new type sliding shoe collector provides a floating contact throughout a monorail system regardless of any misalignment due to bent bars or at switch and inter-lock connections.

KANT-SHOCK Electrification positively eliminates all the hazards of open bar conductors — prevents costly accidents — protects employees — reduces insurance rates.

Write for KANT-SHOCK Bulletin KS-1

Member of Materials Handling Institute and Monorail Manufacturers Association

For Power Driven Conveyors, Use Landahl Chainless Conveyors



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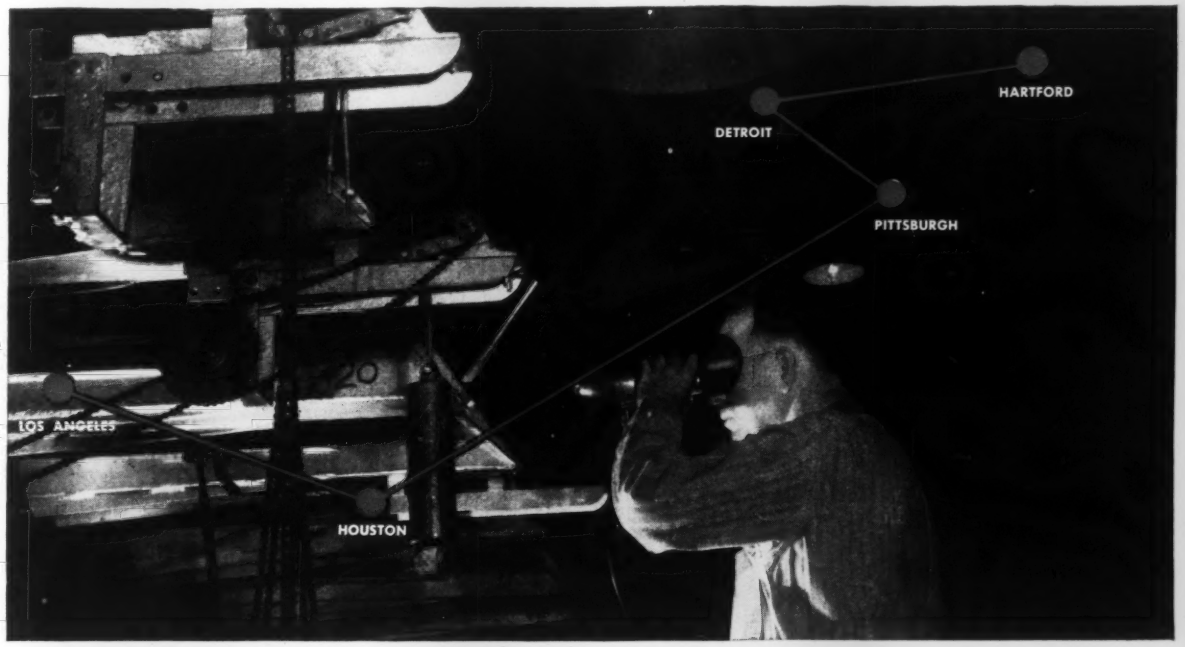
Firth Sterling ...

PIONEER IN POWDER AND MOLTEN METALLURGY



UNIQUE NATION-WIDE SINTERING PLANT NETWORK PROVIDES FAST SERVICE ON CARBIDES

Firth Sterling was the first carbide manufacturer to set up sintering facilities at its branch warehouses . . . now has a network of five such plants strategically located to provide on-the-spot service to tool fabricators in the metalworking centers across the nation.

This local service on semi-standard and special carbide shapes, coupled with the broad selection of standard carbides in the Firthite line and the metallurgical skill developed in 30 years of experience with carbide tooling problems, make Firth Sterling a logical source for practical help with carbide applications.

Call your nearest Firth Sterling representative or distributor for specific information on how the sintering facilities can serve you on special tooling problems. Standard carbides, high speed steels and tool and die steels are also available promptly from Firth Sterling's warehouse and distributor stocks.

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Expansion of sintering facilities is another example of Firth Sterling leadership in meeting requirements of the metalworking industry. If you have a metallurgical problem, powder or molten, we are sure we can help you solve it. Please let us hear from you.

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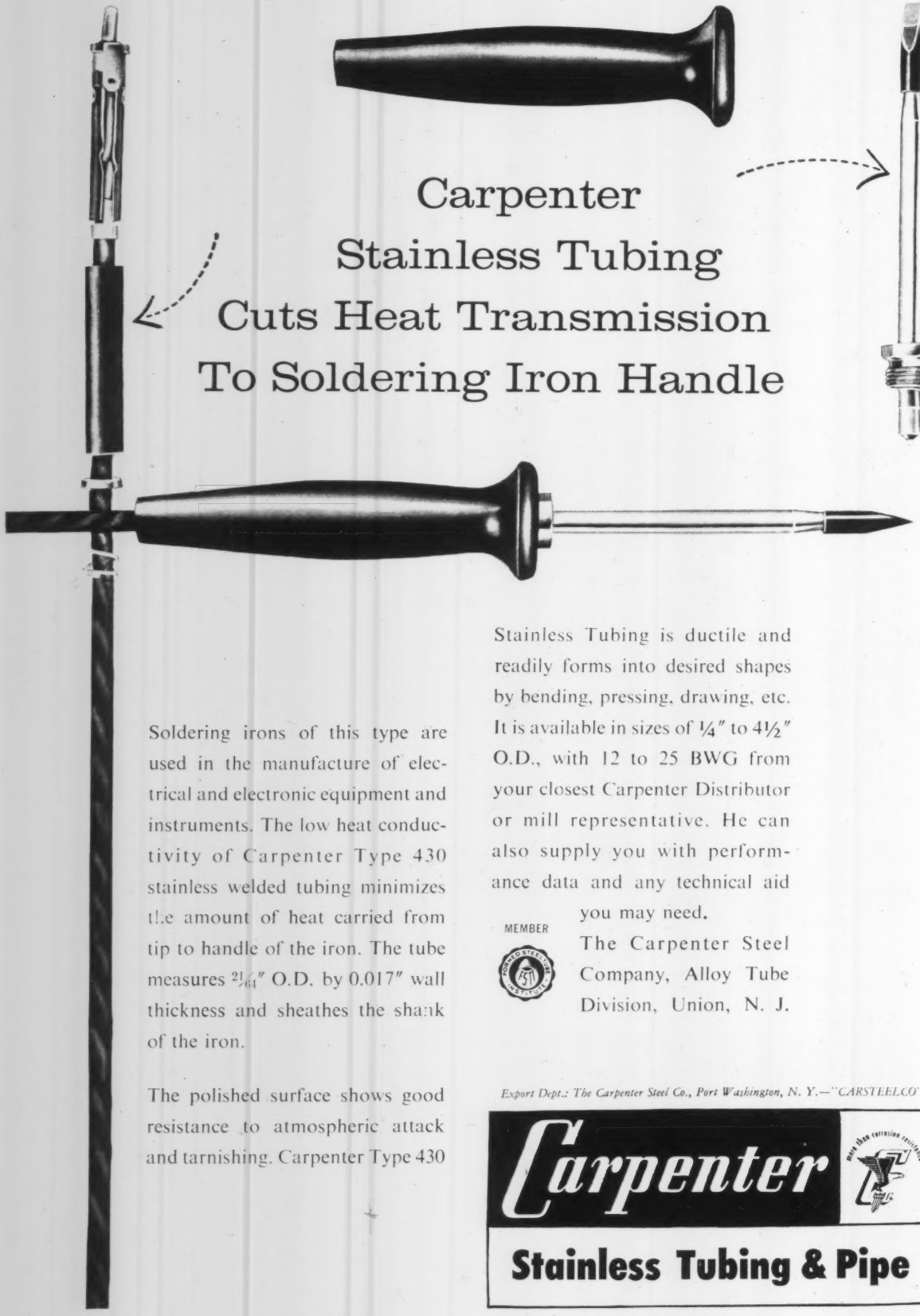

Carpenter Stainless Tubing Cuts Heat Transmission To Soldering Iron Handle

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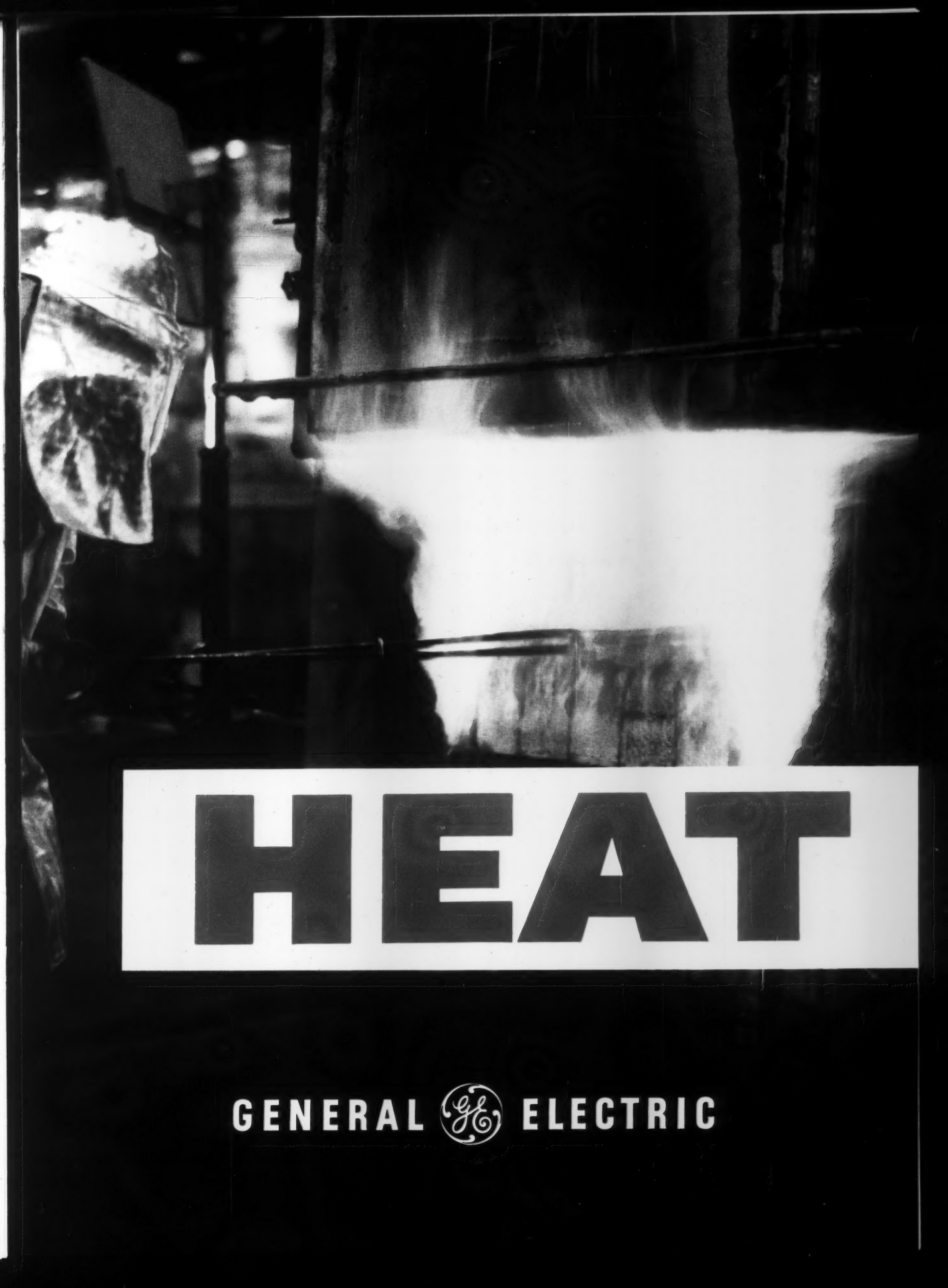
more than corrosion resistance

Stainless Tubing & Pipe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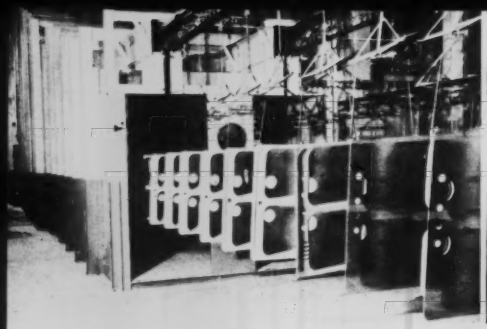
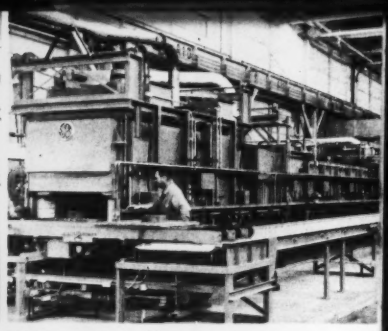
GENERAL ELECTRIC

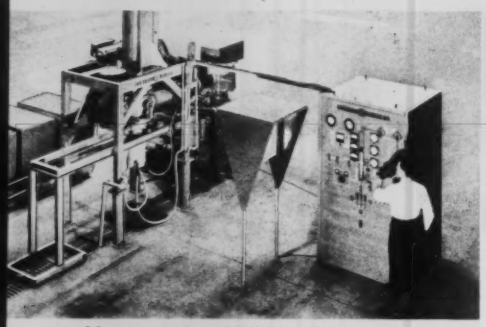


Overhead-conveyor Furnace

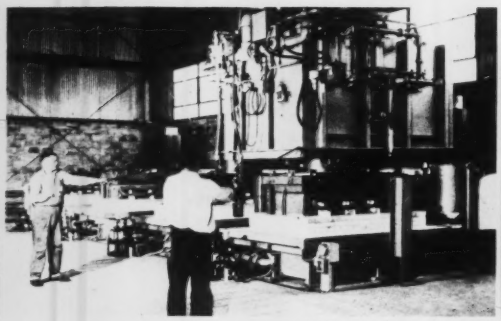
High-temperature Box Furnace



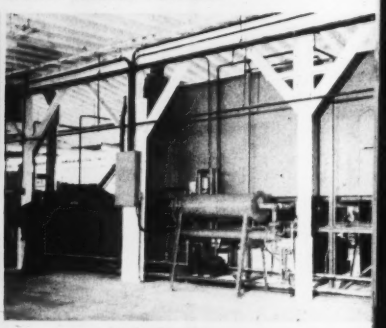
Roller-hearth Furnace



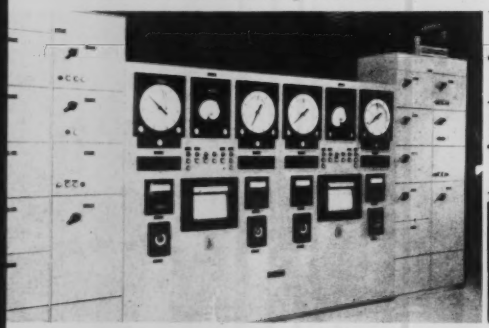
Vacuum Arc Melting Furnace



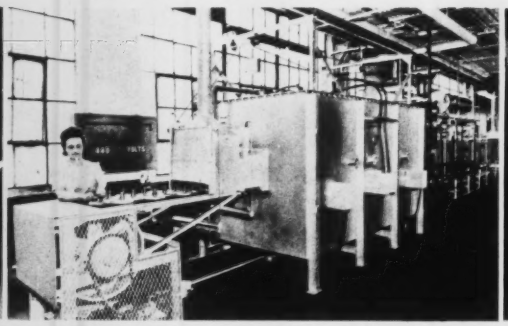
Gas-fired Vacuum Bell Furnace



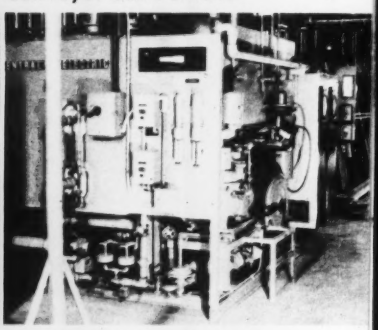
Conveyor Belt Furnace



Heat Processing Control Panel

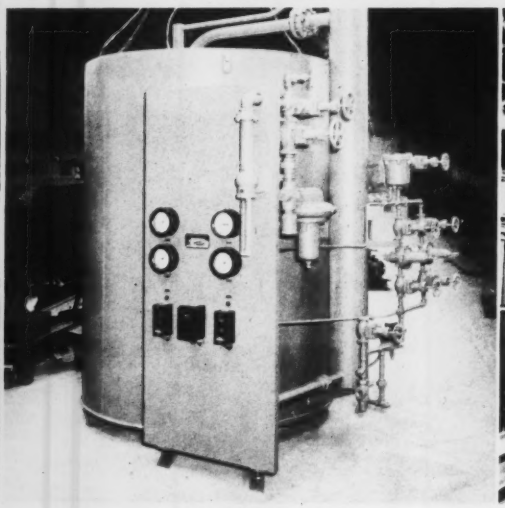


Mesh-belt Furnace, Gas or Electric

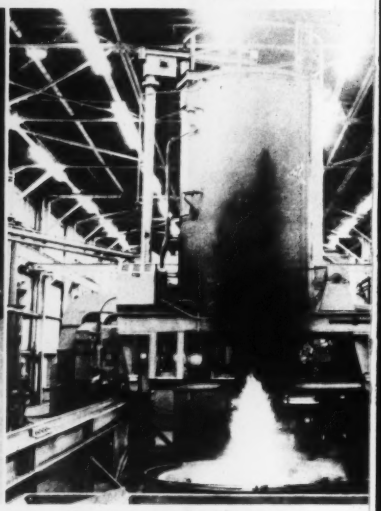


Endothermic Gas Producer

Cylindrical Pit Furnace

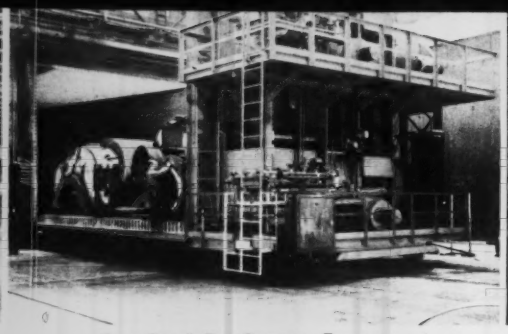


Ammonia Dissociator

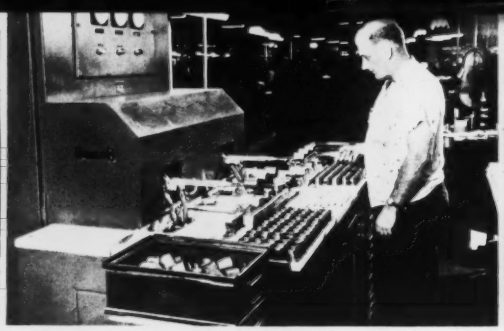


Traveling Cylindrical Furnace

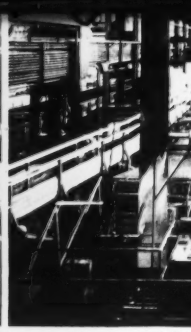
HEAT FOR MANY



Gas-fired Car Bottom Furnace

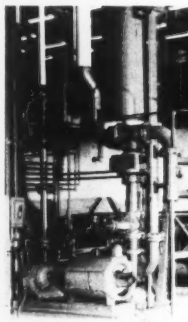


Electronic Induction Heaters



Horizontal S

Hump-typ



Purified Ex

HERE'S HOW INVESTMENTS IN G-E ELECTRIC, GAS AND INDUCTION HEATING INSTALLATIONS PAY OFF

Heat processing modernizations planned and built by General Electric normally pay for themselves in from two to three years. This means a 30% to 50% return on your invested dollars and heavy contributions to profit when the furnace is paid for. This high return is possible because you can:

Reduce Work spoilage. G-E gas, electric and induction heating equipments give you uniform and consistent high quality. With General Electric equipment, heat processes may be set and controlled within close limits. Little supervision is needed. Human error can be eliminated.

Lower operating costs. Maintenance and operating labor can be placed in more important work.

Increase your sales. Products of improved quality and lower cost help to give you a competitive advantage.

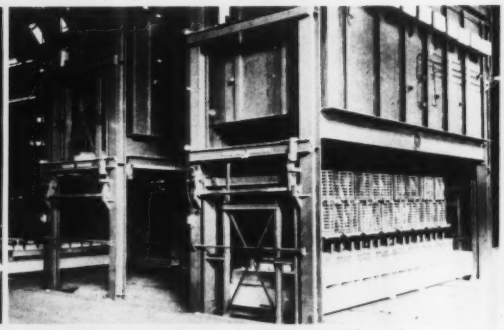
Get fuel economies. Costs of various fuels have changed noticeably in many localities during the past 20 years. Furnaces built in 1938 may not let you take advantage of the most economical heat source in your area today.

Meet specialized needs with General Electric's extensive line of electric furnaces, gas furnaces and induction heaters in many standard sizes, types and ratings.

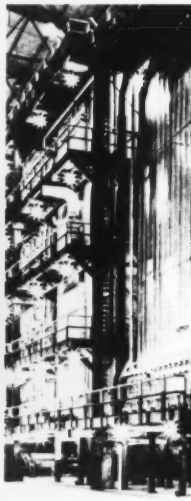
Are obsolete heat processing equipments reducing your profits? Your present costs can be figured easily and compared with the low costs possible with an integrated heat process system planned by General Electric. For a complete analysis of your heat treating facilities, call your nearest General Electric Apparatus Sales Office. Section 721-10, General Electric Company, Schenectady 5, New York.

GENERAL ELECTRIC

Motor-Generator Induction Heater



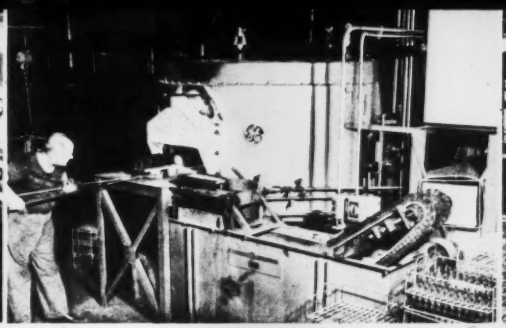
Elevator Furnace, Gas or Electric



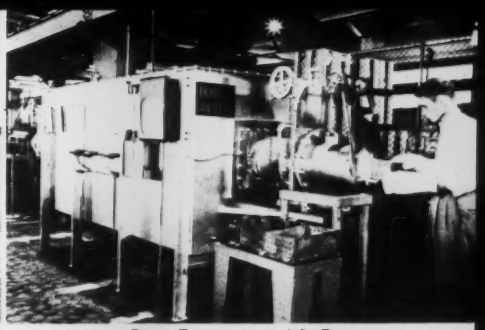
Vertical Str

NEEDS *from* GEN

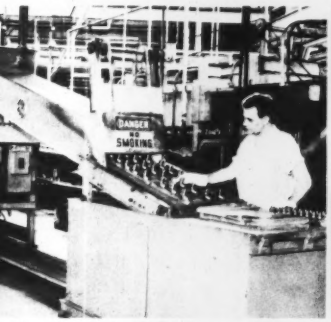
l Strip Annealing Furnace



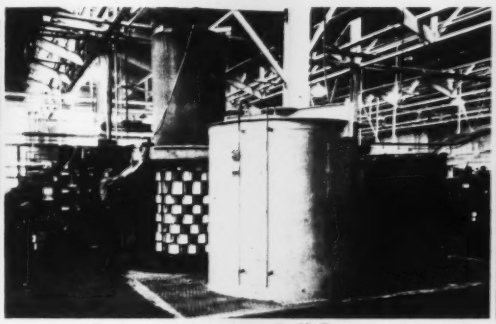
Rotary Hearth Furnace, Gas or Electric



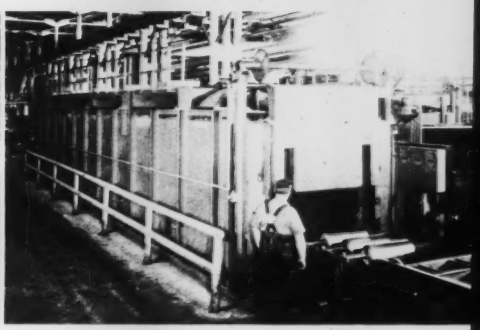
Box Furnace with Retort



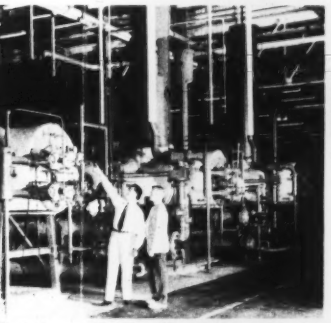
ype Mesh-belt Furnace



Low-temperature Bell Furnace



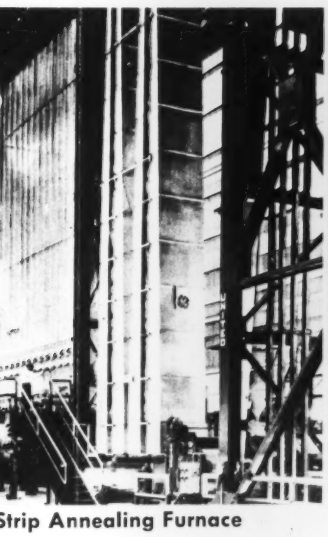
Pusher-type Furnace, Gas or Electric



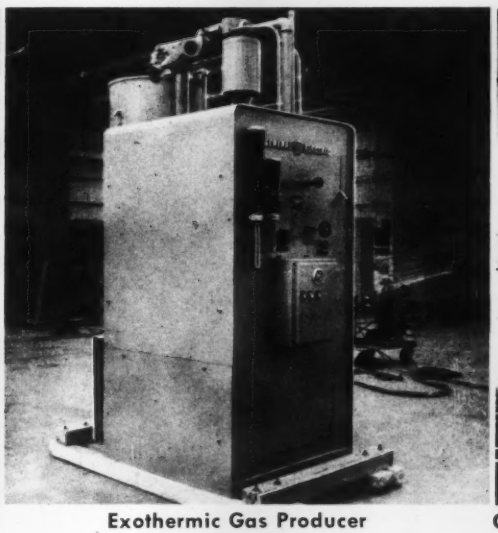
Exothermic Gas Producer

Heaters and Soldering Irons

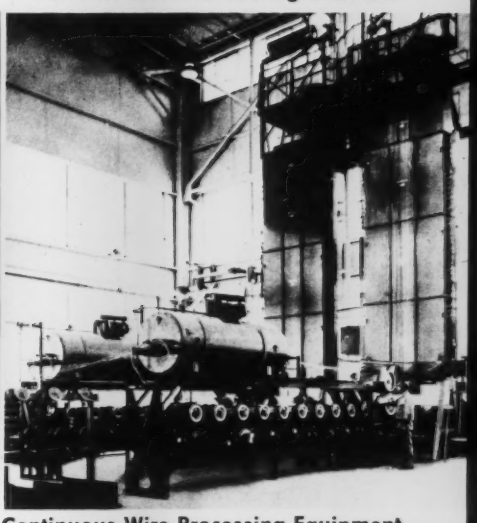
Box Furnace with Cooling Chamber



Strip Annealing Furnace



Exothermic Gas Producer



Continuous Wire Processing Equipment

NERAL ELECTRIC

General Electric Heating Equipment for Your Process	Box with Cooling Chamber	High Temperature Box	Box with Retort	Mesh-Belt	Hump Mesh-Belt	Roller Hearth	Elevator	Low-temperature Bell	High-temperature Bell	Pit	Tower	Horiz. Strip	Rotary Hearth	Conveyor Hardening	Pusher	Car Bottom	Overhead Conveyor	Traveling Bell	Vacuum Bell	Wire Enameling	Purified Exothermic	Ammonia Dissociator	Endothermic	Exothermic	Vacuum Arc	Elec. Induction	M-G Induction	Heaters & Devices
Aging							X	X		X																		
Annealing	X	X	X	X	X	X	X	X	X	X	X	X			X	X		X	X		X	X	X	X		X	X	
Brazing	X		X	X	X	X	X		X						X				X		X	X	X	X		X	X	
Drawing	X			X		X		X		X			X		X	X		X			X			X				
Vitreous Enameling		X		X													X											
Continuous Wire Processing																				X	X	X	X	X		X		
Forging		X											X		X											X	X	
Malleabilizing						X	X	X	X						X						X							
Nitriding			X					X																				
Normalizing	X	X				X	X			X			X		X	X		X			X		X	X		X	X	
Hardening	X	X			X	X				X			X	X		X		X			X	X	X	X		X	X	
Sintering	X		X	X	X	X			X						X				X		X	X	X					
Stress Relieving	X		X	X	X	X	X	X					X		X	X		X			X			X		X	X	
Melting																									X			X

GENERAL ELECTRIC

APPLICATIONS

ALL OF THIS LITERATURE IS AVAILABLE FROM GENERAL ELECTRIC

- ☐ Furnace and Induction Brazing, GEA-5889
- ☐ How and where to use Electric-furnace Brazing, GEA-3193
- ☐ How to Braze Stainless Steel, GER-1331
- ☐ Heat Treating Aluminum, GEA-5912
- ☐ Annealing of Malleable Iron, GEA-5797
- ☐ How to Get the Best Results from Sintering Furnaces, GER-978
- ☐ Temperature Control of Heat Treating Furnaces, GER-1206
- ☐ Protective Atmospheres for use with Industrial Furnaces, GEA-5907
- ☐ New General Electric Induction Heaters, GEA-6388
- ☐ Catalog of General Electric Heaters and Devices, GEC-1005

SECTION 721-10
GENERAL ELECTRIC COMPANY
SCHENECTADY 5, NEW YORK

Please send me the following bulletins.

GEA-. . . . , ... , ... , ... , ... ,

GER-. . . . , ... , ... , GEC-. . . . . ,

NAME. . . . . .

TITLE. . . . . .

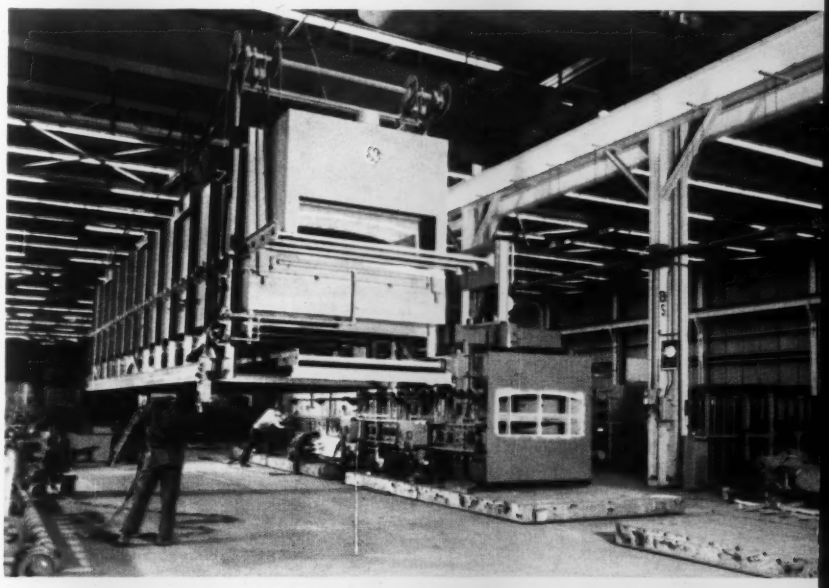
COMPANY. . . . . .

ADDRESS. . . . . .

CITY. . . . . STATE. . . . . .

G-E MATERIALS HANDLING SYSTEMS SPEED PRODUCTION

Modernization and mechanization of heat processing systems speed production, give uniformity of product, improve quality, and reduce your manufacturing costs. General Electric can supply materials handling equipment, atmosphere producers, instruments, quenching equipments and furnaces or induction heaters to give you "one source" responsibility for your heat treating line.

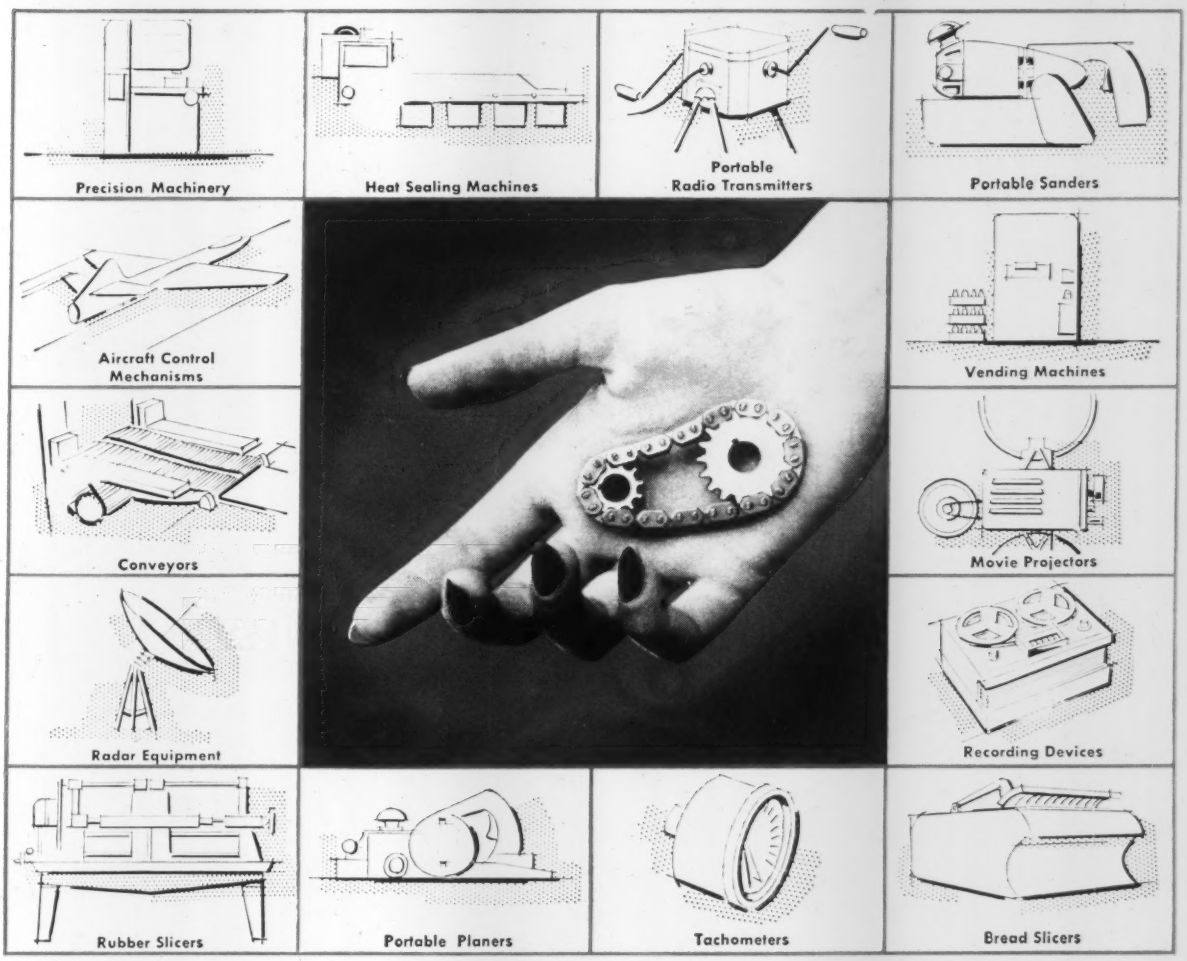


FACTORY ASSEMBLY REDUCES YOUR INSTALLATION TIME

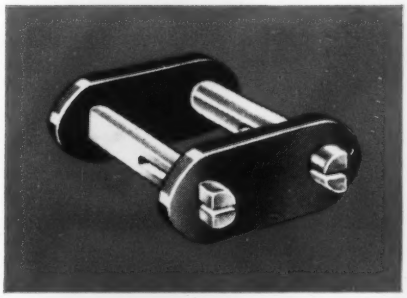
General Electric can completely assemble large furnaces in its Shelbyville, Indiana plant. This means that when you buy from General Electric you can have your piped and wired furnace on the line more quickly and with lower over-all first cost. Experienced furnace builders handle every step of construction and General Electric provides either supervision or complete installation at your plant.

Progress Is Our Most Important Product

GENERAL ELECTRIC



MORSE'S TINIEST CHAIN GIVES POSITIVE DRIVES UP TO 10,000 RPM . . . AND IN LIMITED SPACE!



EXCLUSIVE!

Patented coupling link makes assembly and removal of Morse 3/16"-pitch Silent Chain easy, permits design of fixed center drives without assembly problems. Your Morse distributor can supply you with exact lengths needed; or you can buy chain in bulk, cut it to size, assemble it yourself with easy-on coupling links.

Trying to get more components into less space? Morse 3/16"-pitch Silent Chain helps you do it—often saves you money, too!

Tiny, but with the strength of steel, these highly efficient drives transmit power as smoothly as a belt at speeds up to 10,000 rpm. Split-second precision of drive frequently permits replacement of costly gears.

You can get Morse 3/16"-pitch Silent Chain in every standard style: shroud, center guide, or duplex; special chain materials are available for use in corrosive or extremely wearing conditions. For skilled engineering help on power transmission in limited space, call your local Morse distributor today. He's listed in the Yellow Pages under "Power Transmission." Or write: *MORSE CHAIN COMPANY, DEPARTMENT 2-38, ITHACA, NEW YORK; Export Sales: Borg-Warner International, Chicago 3, Illinois.*

IN POWER TRANSMISSION
THE TOUGH JOBS COME TO

MORSE BW*

*Trademark

STRIP for action . . .

The efficient action of a Flat Spring is dependent upon the quality of the STRIP STEEL.

WASHBURN

has over fifty years of experience in solving spring steel problems, to guarantee the quality of your product.

Flat Tempered and Untempered Wire in .50 to 1.25 Carbon Range.

Flat Cold Rolled Strip 6" and Narrower, Bright, Galvanized, Tinned and Cadmium Finish.

Round Untempered Low and High Carbon Spring Wires.

WASHBURN WIRE COMPANY, NEW YORK CITY

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CLEAN, UNIFORM BILLETS — STRIP — RECTANGULAR, ROUND, FLAT RODS
TEMPERED AND UNTEMPERED FLAT AND ROUND HIGH CARBON WIRES

Push the button . . . then check your watch!

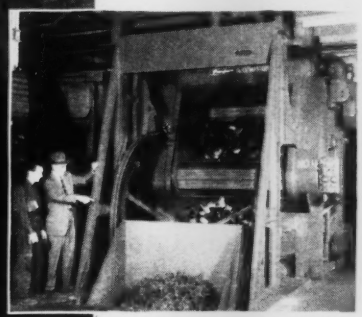
Rotoblast® cleans quickly and automatically... gives you *more* production with *less* manpower!

This control panel on the Pangborn Rotoblast Barrel is a symbol.

It stands for *speed*—push the Start button and a few minutes later you can push the one for Stop. It means *automatic operation*—just one man is needed to run it. And *quality*, too—between Start and Stop, whirling Rotoblast thoroughly blast cleans your castings to a silvery finish.

From original engineering through rugged construction to expert installation, Pangborn Rotoblast Machines are designed to satisfy you on every count—speed, performance, maintenance.

The Pangborn Engineer in your area will be glad to take off his coat and go to work on your cleaning problem at no obligation. And, for more information, write today for Bulletin 226 to: PANGBORN CORP., *1600 Pangborn Blvd., Hagerstown, Md. Manufacturers of Blast Cleaning and Dust Control Equipment.*



Pangborn Rotoblast Barrel for efficient batch cleaning. Available in 1½, 3, 6, 12, 18, 30 and 72 cubic foot sizes.

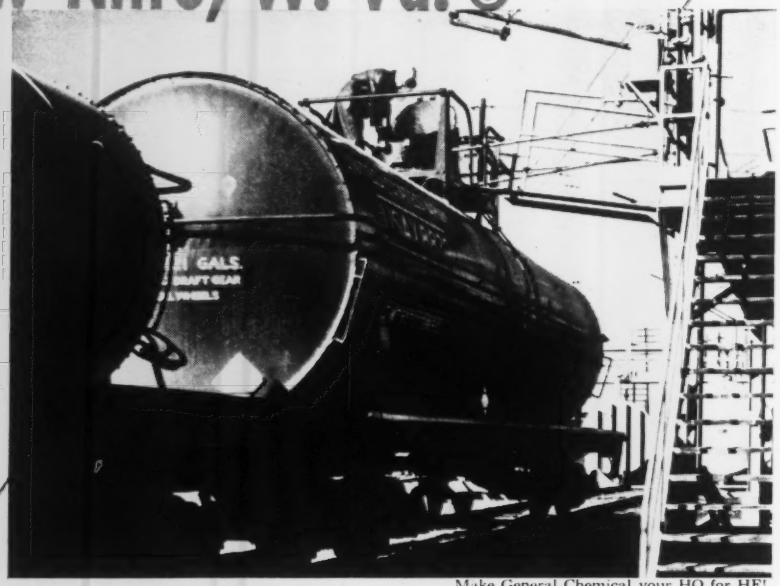
Clean it fast with **Pangborn ROTOBLAST**

General Chemical announces its

THIRD HF PLANT!

Now Nitro, W. Va. ③

① MARCUS HOOK, PA.



Make General Chemical your HQ for HF!

② BATON ROUGE, LA.

Construction is now underway for General Chemical's third hydrofluoric acid plant. Producing both aqueous and anhydrous acid, it will augment the company's already extensive HF capacity at Baton Rouge, La., and Marcus Hook, Pa.—and assure ample reserves to meet industry's needs for the foreseeable future.

Your Most Dependable Source of Supply for HF

General Chemical is the *only* supplier offering shipment from more than one producing location. In addition, it has five HF stock points at Buffalo, N. Y., Chicago, Ill., Cleveland, O., El Segundo, Calif. (Los Angeles), and Pittsburgh, Pa.

Also important to you is General Chemical's integrated raw materials position—your best protection against interruptions of supply. General owns and operates its own fluorspar mines and mills, and sulfuric acid plants. These, together with multiple, high-capacity HF plants, plus strict quality control all along the line, make *General* your most dependable source of supply for hydrofluoric acid.

First For Fluorine Chemicals

GENERAL CHEMICAL DIVISION

40 Rector Street, New York 6, N. Y.

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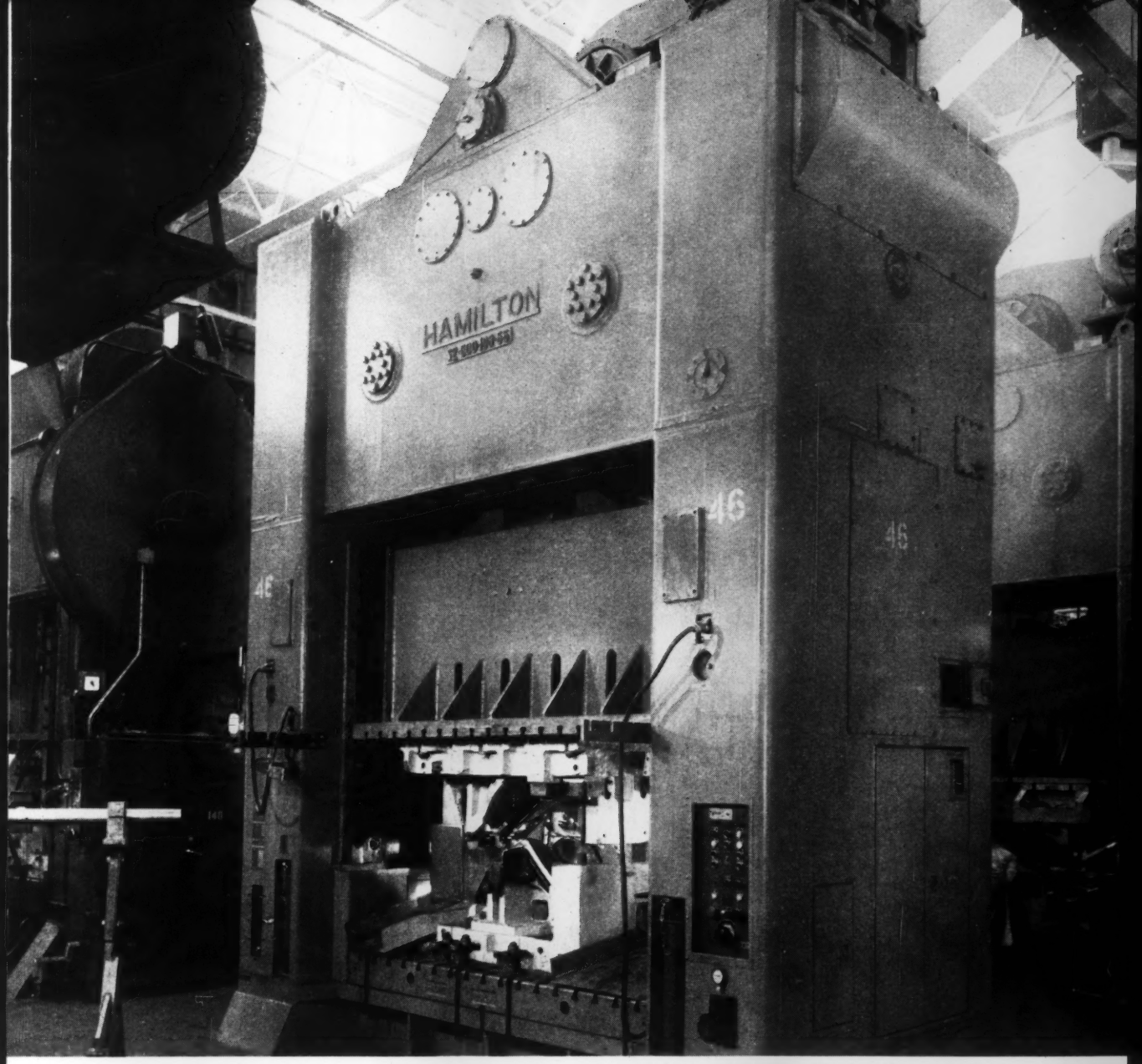


This versatile 600-ton Hamilton Eccentric Gear Press is currently turning out a wide variety of parts in a major automobile plant in Detroit.

Why an eccentric gear press?

Hamilton Eccentric Gear Presses are ideally suited for heavy duty operations—particularly deep draws and other stamping operations where the tonnage is encountered well up on the stroke.

The eccentric and gear are integral and rotate on a short eccentric pin, as a result of which torsional and bending loads are negligible.

The many added features of Hamilton Eccentric Gear Presses guarantee greater production, improved stamping quality, and lower maintenance costs.

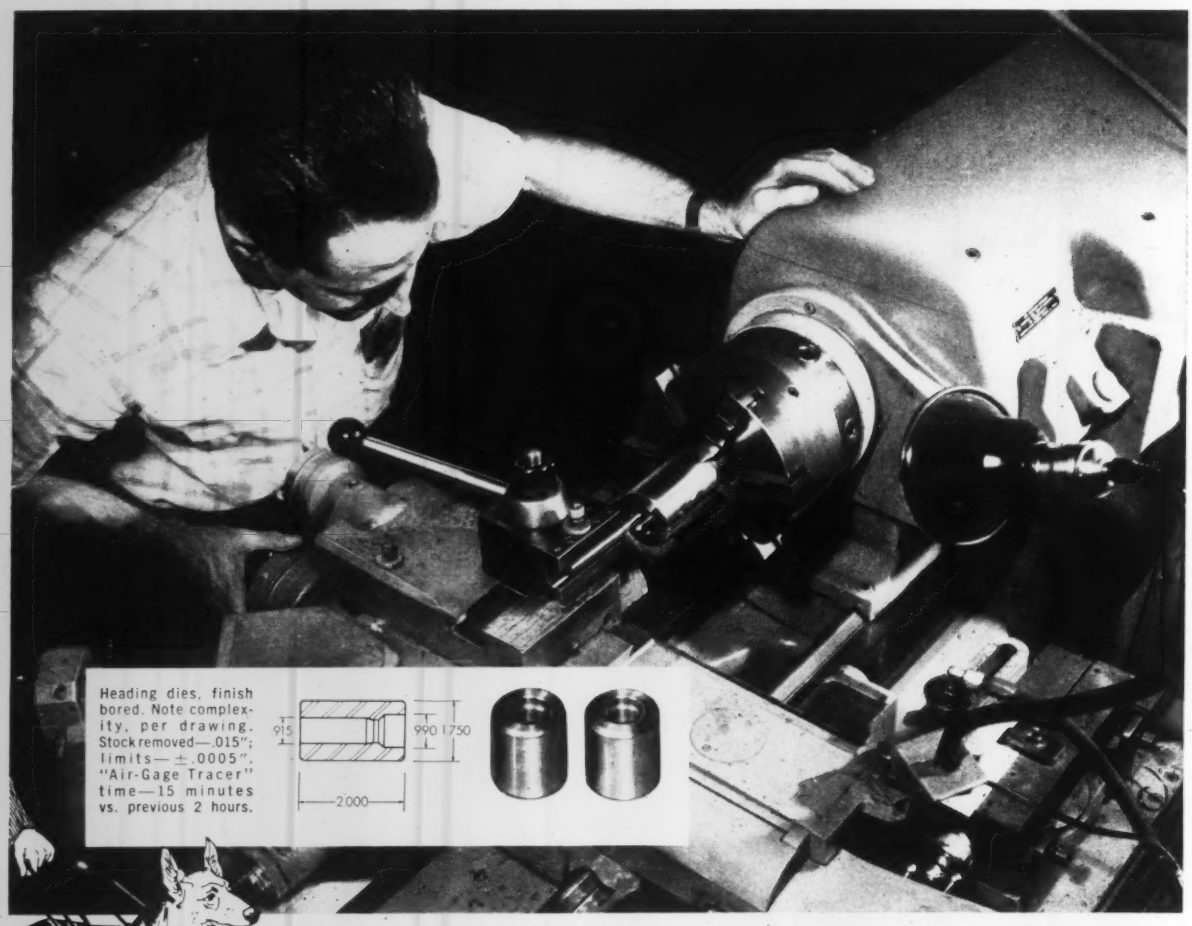
Write to Dept. 1C for Bulletin #13301, describing these machines

Hamilton Division Hamilton, Ohio

BALDWIN · LIMA · HAMILTON

Diesel engines • Mechanical and hydraulic presses • Can making machinery • Machine tools

BALDWIN BLH LIMA-HAMILTON


Heading dies, finish bored. Note complexity, per drawing. Stock removed—.015"; limits—±.0005". "Air-Gage Tracer" time—15 minutes vs. previous 2 hours.
915
990 1750
2.000

"Seeing-Eye Tool"

for close-limit blind boring

Want to take the guesswork out of close-limit blind boring? And with it that unhappy combination of low production and high spoilage? How? Let the Monarch "Air-Gage Tracer" be your lathe operator's seeing-eye.

With this device you're as certain of meeting tolerances in boring as in turning or facing. Your template is precise. Your tracer stylus, operating on a pressure of only 5-6 ozs., converts changes in template contour to corresponding tool positions within a few thousandths of a second. You hold size with certainty piece after piece—the template sees to that. Up goes production anywhere from 10 to 90%, accuracy and finish are improved—all accomplished with the most accurate duplicating device yet designed.

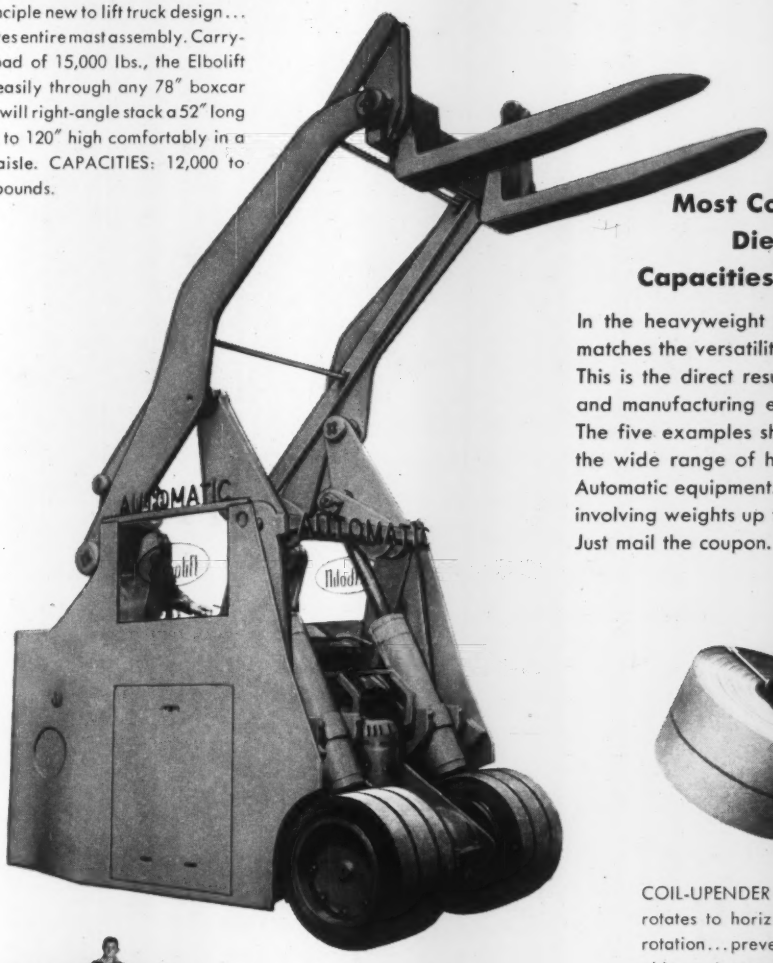
The "Air-Gage Tracer" can be factory-applied to most Monarch lathes. Prove *your* vision by requesting full information in the form of our complete booklet No. 2608..... ***The Monarch Machine Tool Company, Sidney, Ohio.***

Monarch
ACCURACY • ECONOMY • LONG LIFE
TURNING MACHINES

FOR A BETTER TURN FASTER . . . TURN TO MONARCH

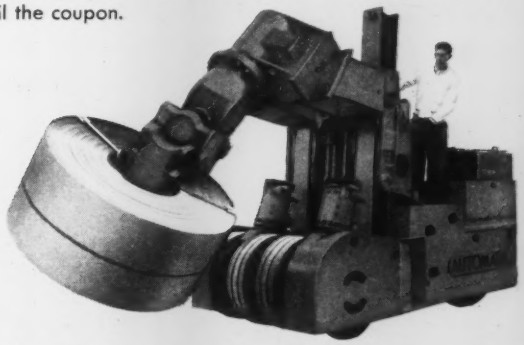
BEST OF THE HEAVIES...

SERIES MF-ELBOLIFT: Works on leverage principle new to lift truck design... eliminates entire mast assembly. Carrying a load of 15,000 lbs., the Elbolift passes easily through any 78" boxcar door... will right-angle stack a 52" long load up to 120" high comfortably in a 13' 8" aisle. CAPACITIES: 12,000 to 20,000 pounds.

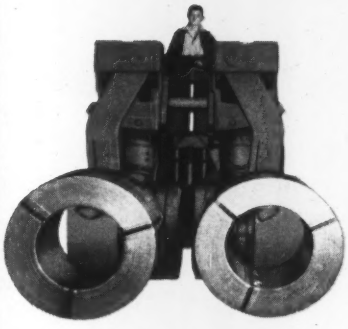


Automatic...
Most Complete Line of Steel and Die Handling Equipment
Capacities up to 110,000 lbs. or more

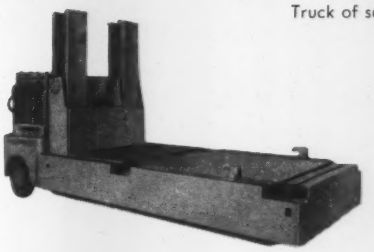
In the heavyweight division of materials handling, no other line matches the versatility and range of Automatic's heavy duty trucks. This is the direct result of many years of specialized engineering and manufacturing experience in the coil and die handling field. The five examples shown here comprise only a small sampling of the wide range of heavy duty handling requirements served by Automatic equipment. So don't hesitate to call us in on any problem involving weights up to any practical limit. No obligation, of course. Just mail the coupon.



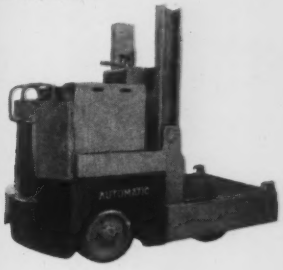
COIL-UPENDER ATTACHMENT: Picks up coil in vertical position and rotates to horizontal or vice versa. Holds coil securely throughout rotation... prevents telescoping. Handles up to 60,000 lbs. Now available on Automatic HR Series or as an attachment for any Automatic Truck of suitable design and capacity.



SKYLIFT GIANT: Heavy duty mast type truck available with either forks or ram. Model shown here has split ram to handle either 1 or 2 coils at a time. CAPACITIES: 20,000 through 80,000 pounds or more.



SERIES TLO: First heavy duty die handlers ever made with completely hydraulic loading, unloading and lift. Bullards move much faster and smoother than in any mechanical system... unloads at end or either side to meet any requirements of space and accessibility. CAPACITIES: 4,000 to 110,000 pounds or more.



MODEL TLO-10: Shortest, most compact 20,000 pound die-handler made... fastest, easiest to maneuver, especially in narrow aisles. Hydraulically operated lift, loading and unloading.

Automatic Electric Industrial Trucks Cost Less to Own... Less to Operate

AUTOMATIC TRANSPORTATION COMPANY
Division of The Yale & Towne Manufacturing Company
77 West 87th Street—Dept. C8—Chicago 20, Illinois

Electric Automatic Industrial Trucks

WORLD'S LARGEST EXCLUSIVE BUILDERS OF ELECTRIC-DRIVEN INDUSTRIAL TRUCKS

AUTOMATIC TRANSPORTATION COMPANY
Division of The Yale & Towne Manufacturing Company
77 West 87th Street, Dept. C8, Chicago 20, Illinois

☐ Please rush me complete specifications on following Automatic heavy duty equipment.

MODELS.....

Your Name.....*Title*.....

Firm.....

Address.....

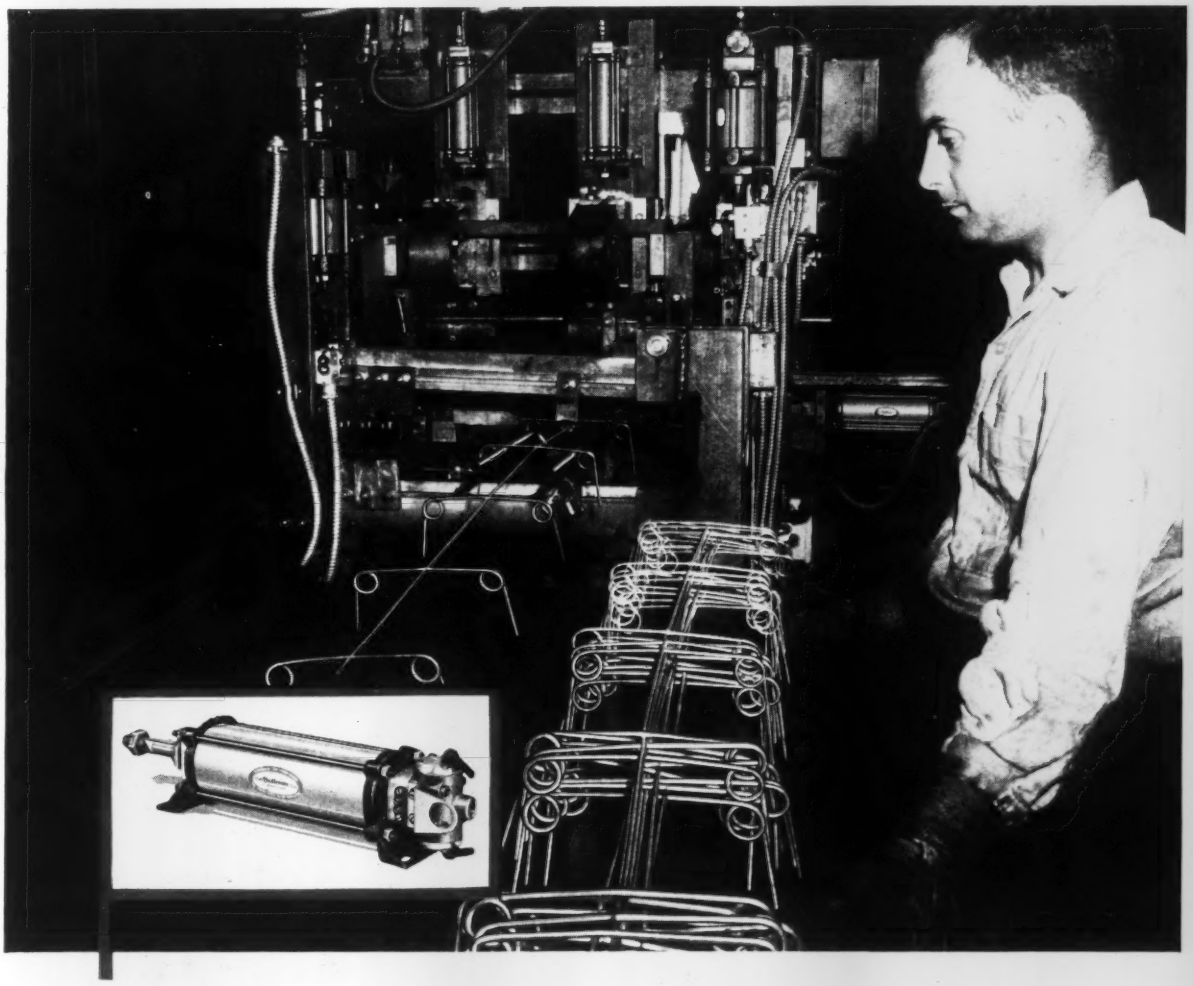
City & Zone.....*State*.....

NOTHING **TRANSMITS POWER** AT SUCH LOW COST FOR **SO LONG** AS ROEBLING ROYAL BLUE WIRE ROPE. No means of transmitting power can be compared—on a cost basis—with Royal Blue, the strongest wire rope you've ever used. Meeting industry's stringent service demands is a function fulfilled by Royal Blue in many ways: unimpaired flexibility, great resistance to shock, abrasion and corrosion . . . a plurality of qualities that make for singularly long service life. For further details on "length through strength," communicate with Wire Rope Division, John A. Roebling's Sons Corporation, Trenton 2, New Jersey.

ROEBLING

Branch Offices in Principal Cities
Subsidiary of The Colorado Fuel and Iron Corporation

ROEBLING
ROYAL·1105·BLUE
DESIGN
FOR WIRE ROPE
Its ready adaptability is evident wherever power is transmitted. It conforms to unique design requirements. Use wire rope to transmit power.



THE BELLOWS AIR MOTOR PUTS PRACTICAL AUTOMATION WITHIN REACH OF EVERY PLANT IN EVERY INDUSTRY

Regardless what you make, The Bellows Air Motor can spark cost-saving ideas in the minds of your methods engineers who are looking for practical ways to put automation to work.

Here's a typical case:

The wire reinforcement shown above is an old product. Many companies had made it by hand without change for over 40 years. But Conver Steel & Wire Co., New York, had an idea.

With Bellows Air Motors as the heart, they designed and built a special machine to cut, move, and form the wire. Bellows Air Motors with a single operator now do the work five men did with their hands.

In your operations, too, there are scores of ways in which these ingenious air cylinder power units can be combined with a little imagination to save money. Packing a lot of "controlled power" in a small space, Bellows Air Motors will perform virtually any pull, push, lift or turn motion quicker, safer and more reliably than it can be done by hand or by cams, gears, levers or other mechanical aids. They put practical cost-saving automation within easy reach of every plant in every industry.

Would you like to see a file of cost cutting ideas other companies have developed using Bellows Air Motors? Write Dept. ST-358, The Bellows Co., Akron 9, Ohio.

In Canada: Bellows Pneumatic Devices of Canada, Lt., Toronto 18.

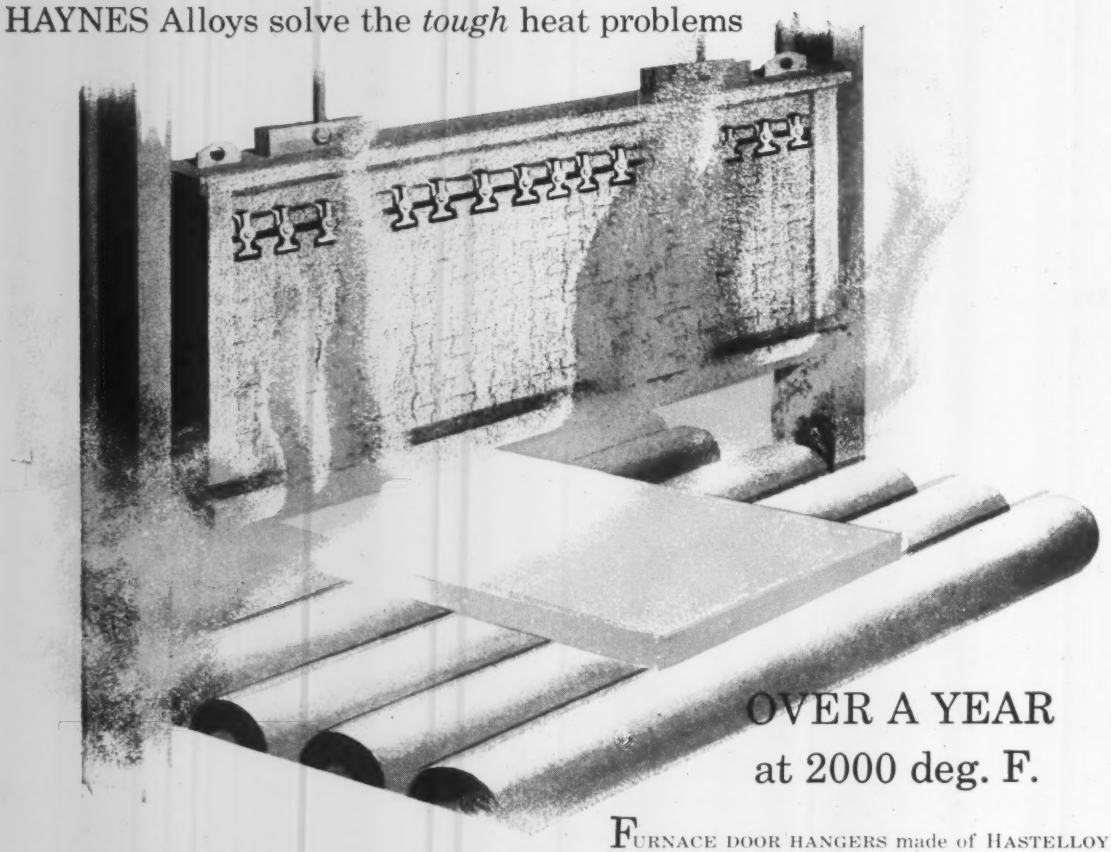
The Bellows Co.

DIVISION INTERNATIONAL BASIC ECONOMY CORPORATION

AKRON 9, OHIO

1031-B

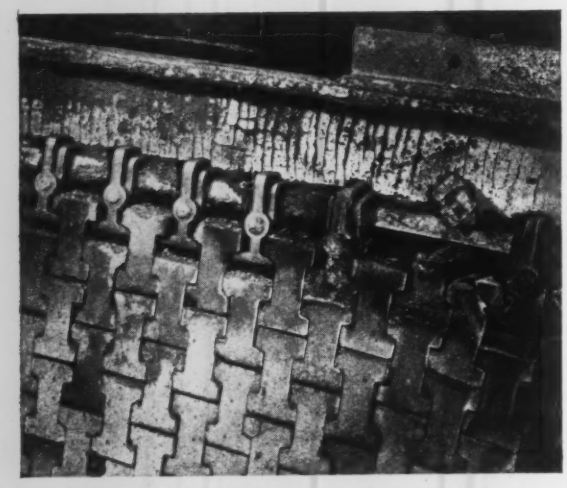
HAYNES Alloys solve the *tough* heat problems



OVER A YEAR at 2000 deg. F.

FURNACE DOOR HANGERS made of HASTELLOY alloy X are nearing completion of their second year of service, where ordinary hangers failed in three to four weeks. They support the interlocking firebrick of the doors and are exposed to the direct impingement from the 2150 deg. F. furnace flame and reducing or oxidizing atmospheres.

This is another example how HAYNES alloys serve the metalworking industries . . . by providing parts that are strong at high temperature. If you have a maintenance or production problem involving temperatures in the 1000 to 2100 deg. F. range, contact HAYNES STELLITE COMPANY, Division of Union Carbide Corporation, General Offices and Works, Kokomo, Indiana. Sales Offices in Chicago, Cleveland, Detroit, Houston, Los Angeles, New York and San Francisco.



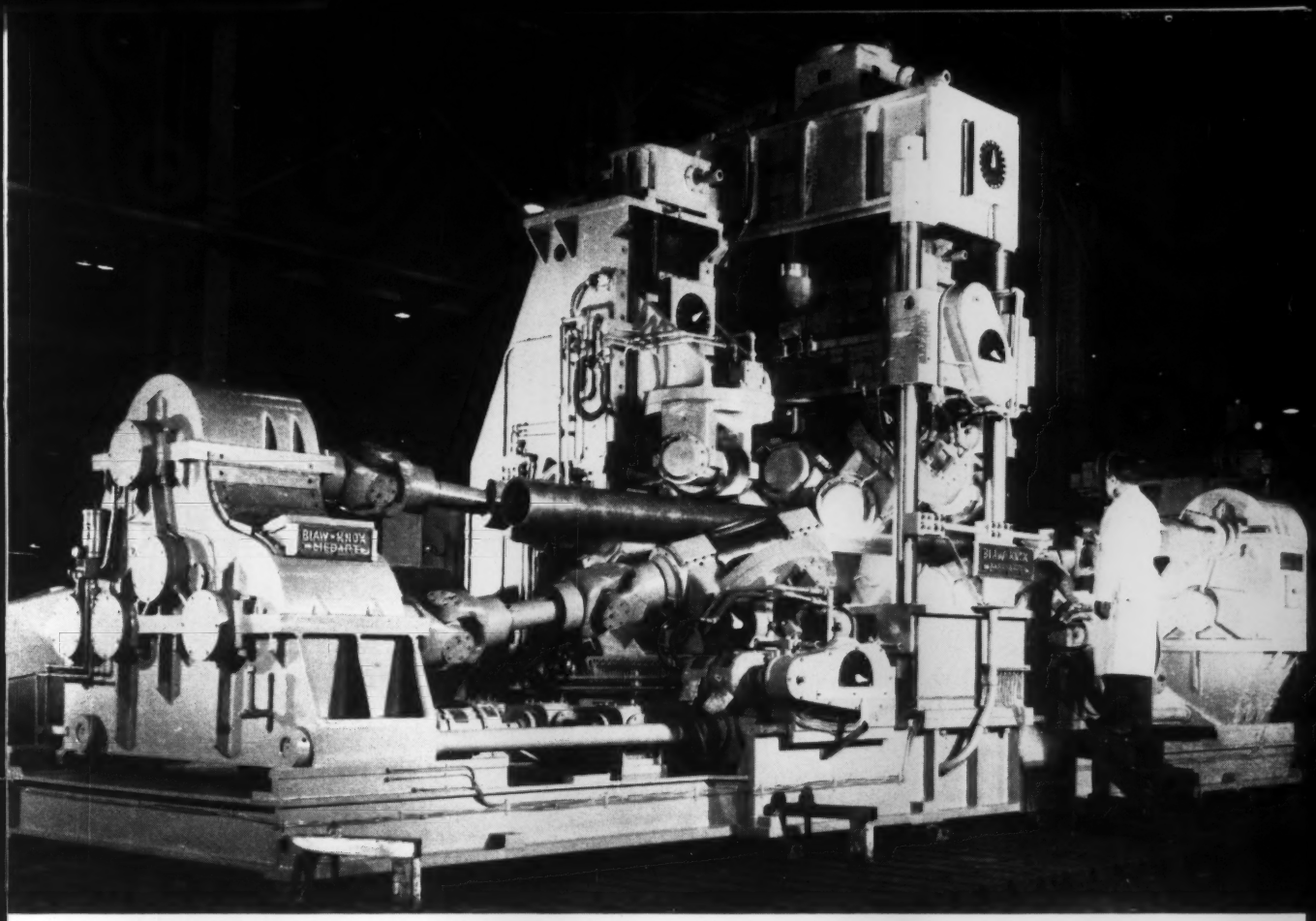
Hangers must maintain firm grip . . . to prevent fire-brick from crumbling. After 5 weeks of operation here's what happened to the hangers—the four on the left are made of HASTELLOY alloy X, the others are not.

HAYNES
ALLOYS

HAYNES STELLITE COMPANY
Division of Union Carbide Corporation
Kokomo, Indiana

UNION CARBIDE

"Haynes," "Hastelloy" and "Union Carbide" are registered trade-marks of Union Carbide Corporation.



Typical of latest Blaw-Knox Medart engineering developments is this patented, low stress 8-roll machine for straightening large diameter thin wall tubing or oil well casing up to 24" O.D.

BLAW-KNOX Medart gives you production line straightening for all Pipe and Tube applications

Blaw-Knox Medart offers the industry's most complete line of pipe and tube straightening equipment. Especially designed and built for todays high speed—high precision requirements, the wide range of these machines makes it possible to handle both steel and non-ferrous tubes and pipe, as well as solid rounds.

Typical of new design developments for high speed straightening is the Blaw-Knox Medart six roll multicycle arrangement in which all work rolls are driven to give a positive torque balance around the work piece. The single motor drive delivers a synchronized positive feed, and the sixth roll gives a double straightening cycle.

For special applications such as thin wall extruded tubing or oil well casing, Blaw-Knox Medart offers a new line of low stress 8-roll machines. A patented arrangement of the roll clusters is responsible for keeping stress concentration in the tube wall to a minimum during straightening.

Whatever your pipe or tube application, whatever types of metals you process, there is a Blaw-Knox Medart straightener designed and built for high speed, precision work.

Standard equipment handles work diameters ranging from $\frac{1}{8}$" to 24". Larger sizes for special applications will be designed on request. Contact us for detailed information, technical assistance or service.

BLAW-KNOX

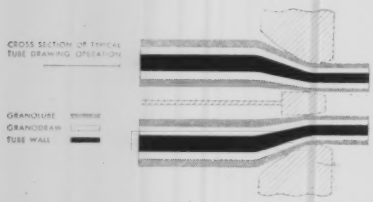
BLAW-KNOX COMPANY

Foundry and Mill Machinery Division
Blaw-Knox Building · 300 Sixth Avenue
Pittsburgh 22, Pennsylvania

CHEMICAL CONVERSION COATINGS and their functions in facilitating the cold mechanical deformation of metals

By ARTHUR DAHL, Product Development Dept., AMERICAN CHEMICAL PAINT COMPANY

When used to facilitate the cold mechanical deformation of metals (in drawing, extrusion, stamping, cold heading, necking, and upsetting operations) chemical conversion coatings in conjunction with suitable lubricants perform three important functions. One, they prevent metal-to-metal contact between work and tool. Two, they prevent galling and seizing. Three, they protect stock indefinitely, permitting the storage of in-process work at any stage of production, without danger of corrosion damage.



Characteristic of the tightly bound, highly absorptive, crystalline coating formed by the processes is the ability of the coating to retain lubricity throughout forming operations when treated with a suitable lubricant. This offers the following production advantages:

- **Higher degree of reduction**
- **Greater speed of draw**
- **Longer tool life**
- **Fewer process anneals and pickling**
- **Finer surface finish**
- **Cleaner mills**
- **Easier inspection of finished product**

Also of interest to production men is the exact duplication of coatings from batch to batch. And the processes are much simpler than other methods of coating metals—baths can be set up and running in less time than it takes to determine suitable coatings by other methods.

TYPES OF COATINGS AND THE METALS FOR WHICH THEY ARE DESIGNED

Zinc phosphate coatings for carbon steel. These coatings can be applied by either dip or spray systems.

Dip. ACP Granodraw No. 1 is typical of the dip process. The sequence includes precleaning, water rinse, pickling, water rinse, Granodraw No. 1 solution, water rinse, and a hot neutralizing rinse. Surfaces to be treated must be free of oil, grease, rust and scale. The above sequence insures that they will be. And when metal is free of rust and scale, the pickling bath and two succeeding water rinses can be omitted. In either case, a lubricant like ACP Granolube or conventional lubricant must be applied prior to working the metal.

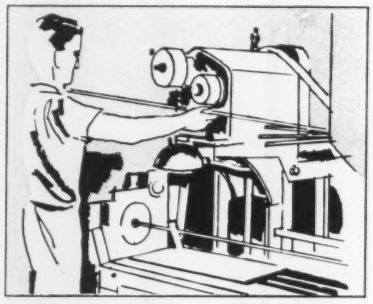
Spray. ACP Granodraw No. 4 is an example of the spray process. It usually requires 5-stage equipment and includes the following steps: precleaning, water rinse, Granodraw No. 4 solution, water rinse, lubricant. After chemical treatment, the work must be dried before forming.

Oxalate Coatings for the stainless steels and many of the high nickel alloys. These coatings are applied only by immersion process, and usually in a 5-stage system which includes an acid pickling or depassivating bath, a water rinse, the ACP Granodraw SS coating bath, a hot borax neutralizing rinse for wire stock, or a lubricating bath for tube stock. Since thorough activation of the metal surface is necessary to promote an adherent coating, the pickling and activating bath is an important stage in processing.

Fluoride-type coatings for zirconium and its alloys. Granodraw ZR is such a coating. It is applied in an immersion process which includes precleaning, water rinse, pickling, water rinse, Granodraw ZR solution, water rinse, drying or lubricating. It has been used primarily in the treatment of stock prior to wire drawing and tube drawing. Surfaces are cleaned of oil and grease by solvent degreasing or alkali cleaning. Pickling is required to provide a surface that is chemically and metallurgically receptive to the coating.

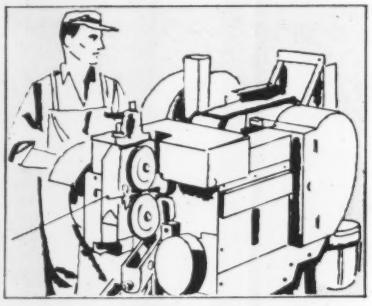
Strong alkali coatings for tantalum and amorphous phosphate coatings for aluminum. These two types of coatings are now in the development stage. Laboratory and field tests are being conducted, results are being evaluated, and modifications in chemical makeup and process sequence are being made to meet requirements. Several field tests, however, have indicated that they will do the same job for tantalum and aluminum processors as the other types of coatings have done for those working carbon steel, stainless steel, high-nickel alloy, and zirconium.

For more information write us at Ambler.

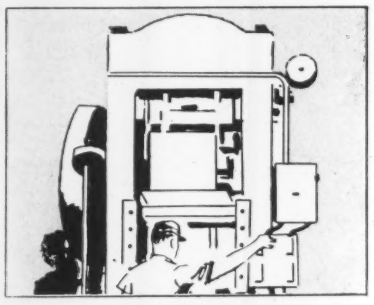


Tube Drawing

Wire Drawing



Cold Heading



Impact Extrusion

Note. Granodraw and Granolube are registered trademarks of American Chemical Paint Company.

CHEMICALS ACP PROCESSES

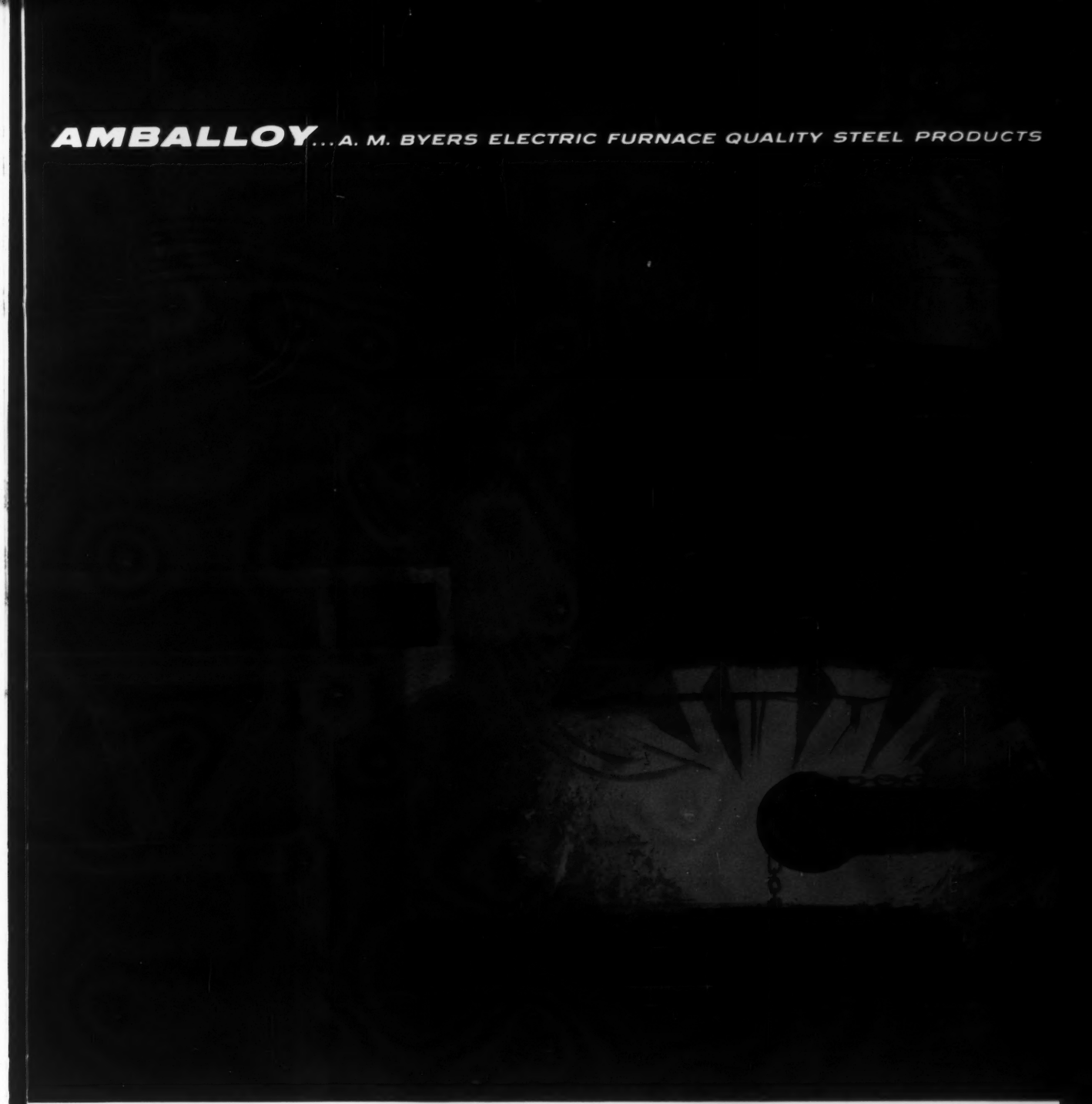
AMERICAN CHEMICAL PAINT COMPANY

Ambler 19, Pa.

Detroit, Mich. • St. Joseph, Mo. • Niles, Calif. • Windsor, Ont.

New Chemical Horizons for Industry and Agriculture

AMBALLOY... A. M. BYERS ELECTRIC FURNACE QUALITY STEEL PRODUCTS



TIMETABLED DELIVERY... SERVICED BY SPECIALISTS

Quality carbon, alloy and stainless steels with the best service in the industry are our guarantee to each customer. We start with a quality product—AMBALLOY steels—then follow up with a firm delivery date that gets your order where you want it, when you want it, fast.

But the Byers service policy extends beyond delivery. High grade production facilities are an important part of our program. We also offer a personalized technical service through our highly trained corps of metallurgists.

Ninety-three years of producing ferrous metals have familiarized us with many of your problems. So check Byers first for your steel requirements. Write for new catalog. A. M. Byers Company, Clark Building, Pittsburgh 22, Pennsylvania.

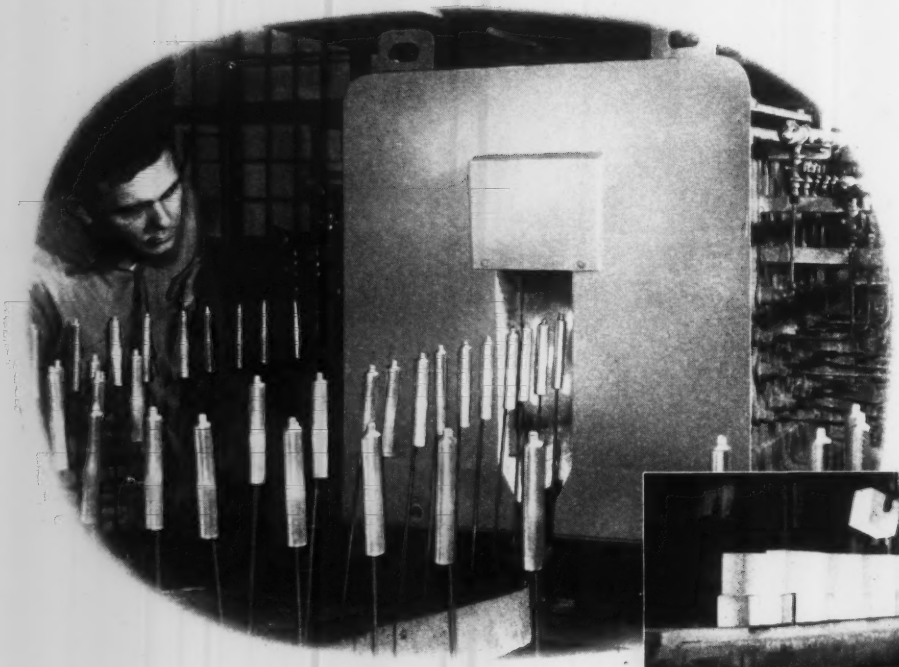
A growth company with the emphasis on quality and service **A. M. BYERS COMPANY**

our research is your reward

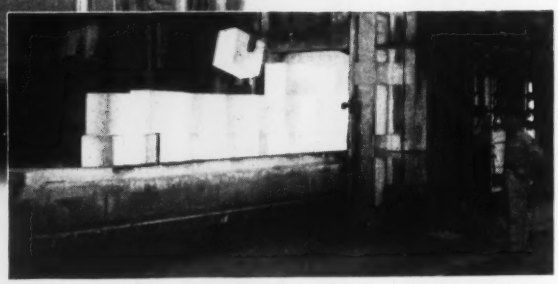
Annealing Featherweight Aluminum Tubes

or

HEATING HEAVY STEEL SECTIONS



Aluminum tubes work-harden after forming, must be annealed. Selas Gradiation anneals on the production line at A. H. Wirz, Inc. Helps cut tube manufacture from 2 days to 45 minutes.



Alloy steel die blocks, 8" to 24" thick, are heated to 1550°F for hardening in Selas custom-built furnace at Heppenstall Company. Completely automatic program-control heating reduces previous 20-30 hr. cycle to less than 4 hr. Sonic testing assures that fast heating is practical and safe.

. . . automatic *Selas Gradiation*® speeds production

Selas Gradiation Heating treats both thin aluminum tubes and thick steel die blocks with the same efficiency. Annealing in one case, heating for hardening in the other, the workpieces respond to the preciseness, the uniformity, the controllability of Gradiation heating with a speed never before accomplished by conventional methods.

Widely separated operations, yet Selas in-line equipment keeps pace with modern production requirements.

To meet the increasing demand of automation, Selas custom-builds specialized equipment designed to accommodate the individual workpiece. Send for informative articles describing in more detail the above applications and for information on Selas Gradiation fast heating. Address Dept. 23.

Selas engineers will be glad to discuss your heat-treating needs with you.

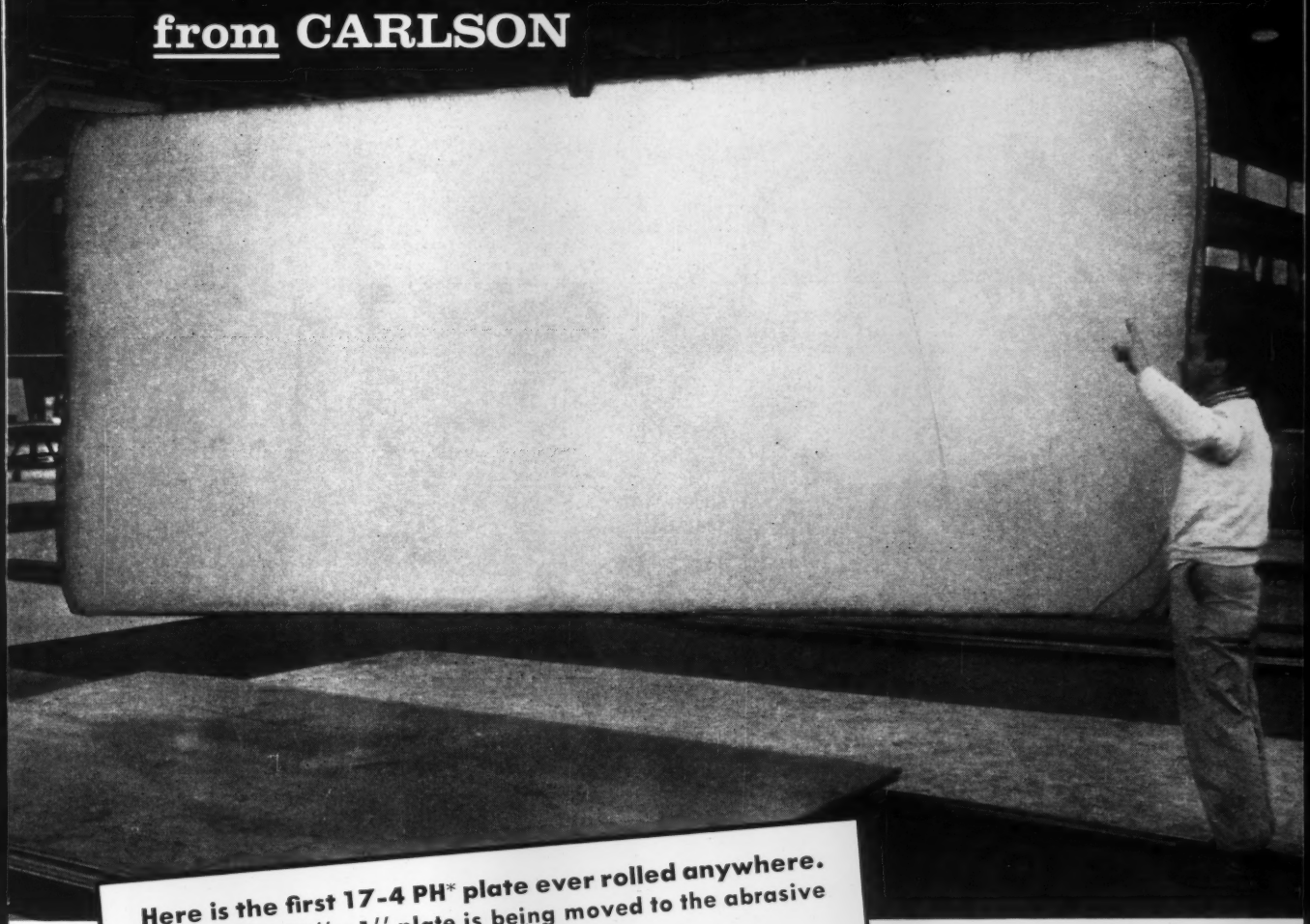
Gradiation is a registered trade name of Selas Corporation of America.

SELAS
CORPORATION OF AMERICA
DRESHER, PENNSYLVANIA

Heat and Fluid Processing Engineers
DEVELOPMENT • DESIGN • CONSTRUCTION

SELAS
STEEL

Now you can get both 17-4 PH* and 17-7 PH* stainless steel plate from CARLSON



Here is the first 17-4 PH* plate ever rolled anywhere. This 179" x 79" x 1" plate is being moved to the abrasive cutters for trimming to specified size.

You can build equipment with either of two precipitation-hardening stainless plate grades—17-4 PH* and 17-7 PH*. Both are available at Carlson—both can be cut to your exact specifications to save delays and true-up time in your own plant.

The Armco-developed 17-4 PH and 17-7 PH grades combine ease of fabrication, hardenability, high strength and corrosion resistance. These grades have the desirable mechanical properties of the hardenable chromium types and a workability and corrosion resistance approaching regular 18-8 stainless steels. Simplified low temperature heat treatments will produce a Rockwell hardness of C40 to C50. And tensile strengths range from 180,000 to 215,000 psi depending upon the heat treatment.

Take full advantage of our complete service in stainless steel plate and plate products. Write, wire or phone for detailed information on 17-4 PH and 17-7 PH stainless steels.

*Trade Mark of the ARMCO STEEL CORPORATION

G.O.CARLSON Inc.

Stainless Steels Exclusively

THORNDALE, PENNSYLVANIA

District Sales Offices in Principal Cities

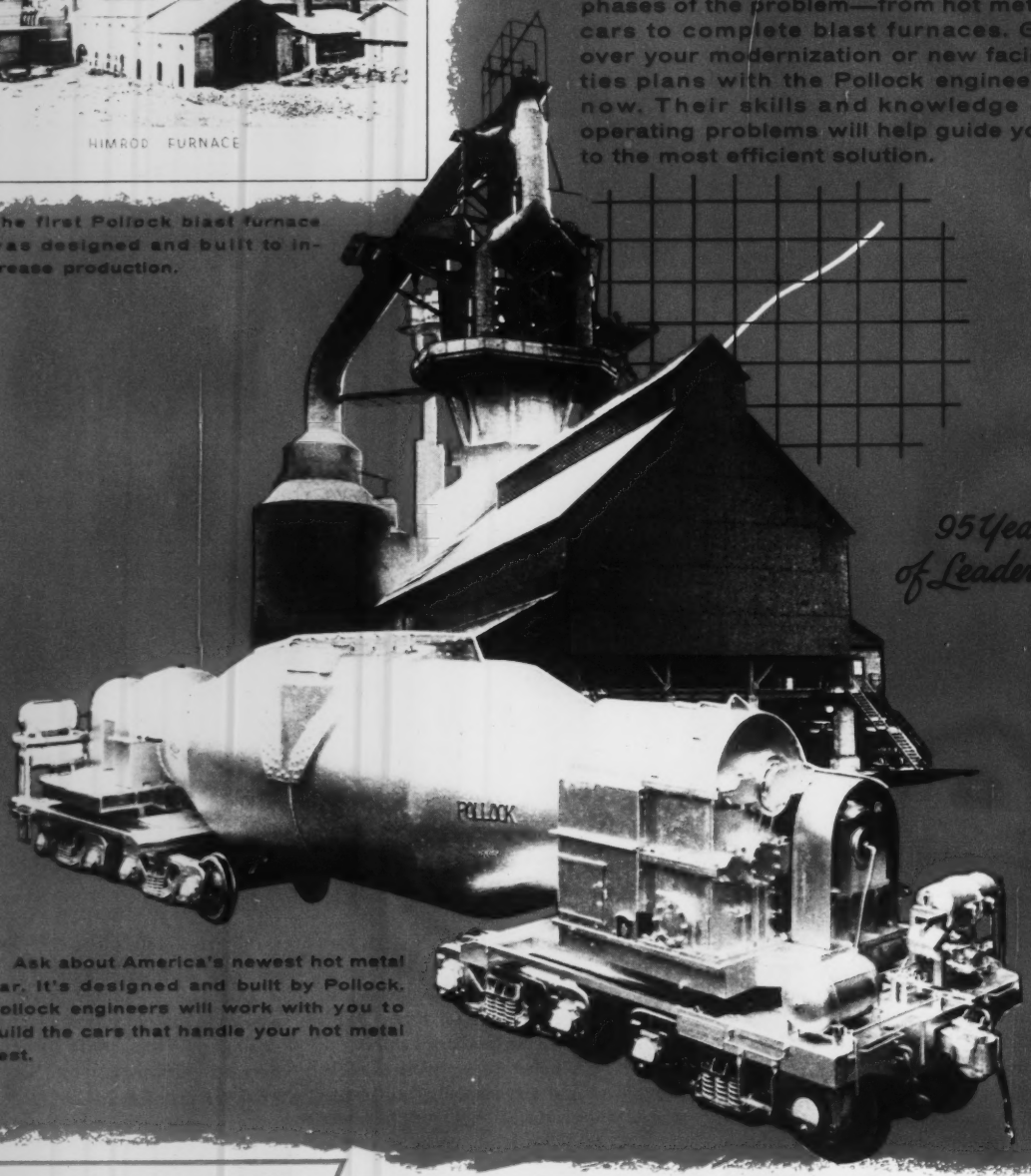
PLATES • PLATE PRODUCTS • HEADS • RINGS • CIRCLES • FLANGES • FORGINGS • BARS and SHEETS (No. 1 Finish)

MORE HOT METAL
at lower handling costs

Lower operating costs start from the ground up. The Pollock Company is singularly equipped to deal with all phases of the problem—from hot metal cars to complete blast furnaces. Go over your modernization or new facilities plans with the Pollock engineers now. Their skills and knowledge of operating problems will help guide you to the most efficient solution.

The first Pollock blast furnace was designed and built to increase production.

95 Years of Leadership



Ask about America's newest hot metal car. It's designed and built by Pollock. Pollock engineers will work with you to build the cars that handle your hot metal best.

POLLOCK
Since 1863

THE WILLIAM B. POLLOCK COMPANY
YOUNGSTOWN, OHIO

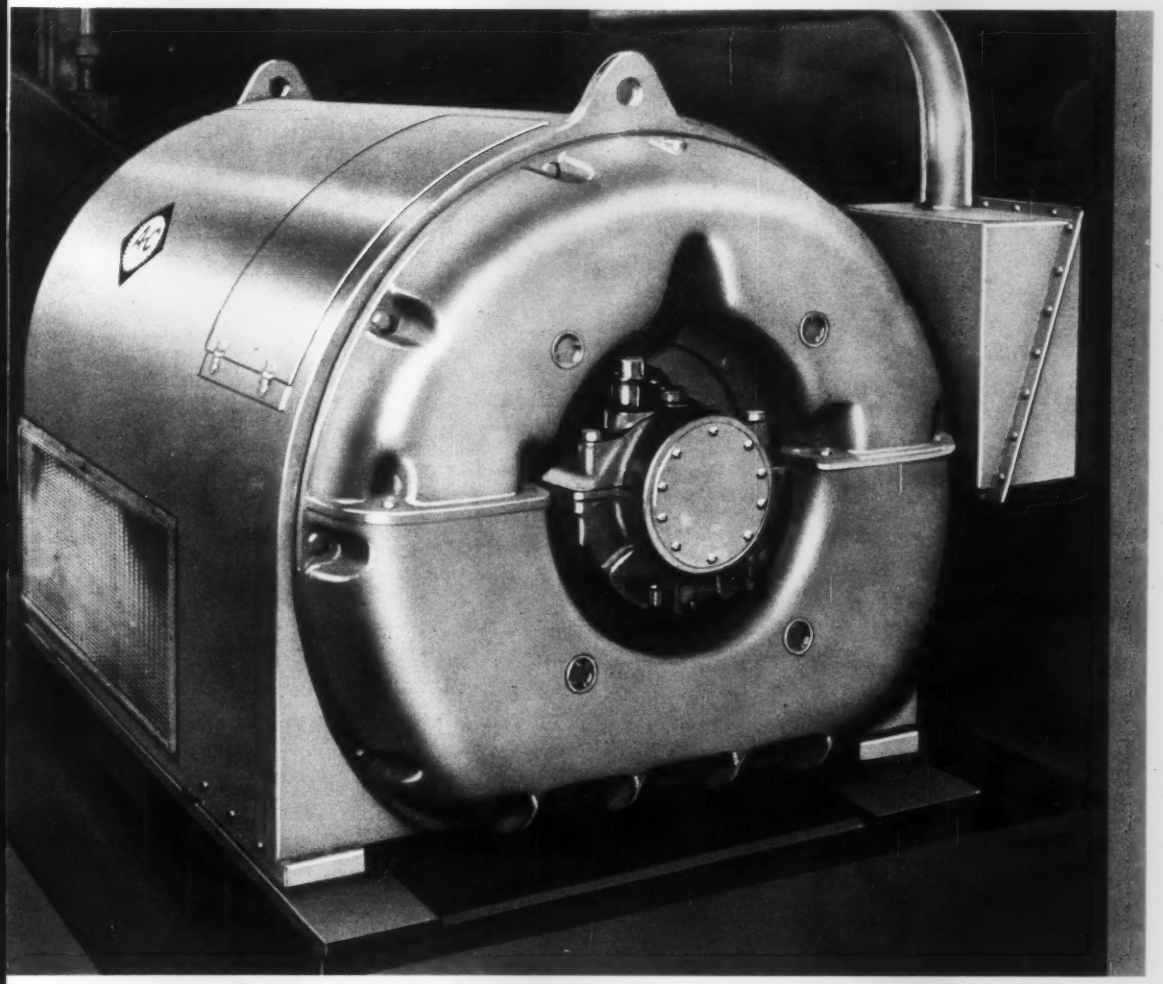
ASSOCIATED IN GREAT BRITAIN WITH ASHMORE, BENSON, PEASE & CO.
STEEL PLATE CONSTRUCTION · ENGINEERS · FABRICATORS · ERECTORS

BLAST FURNACES • HOT METAL CARS AND LADLES • CINDER AND SLAG CARS • INGOT MOULD CARS • CHARGING BOX CARS • WELDED OPEN HEARTH LADLES

Revolutionary Advance in Motor Protection

made possible by SILCO-FLEX insulation

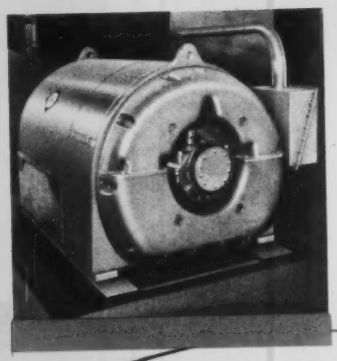
plus 10 integrated mechanical features



Designed to meet needs of chemical, paper, petroleum, metals, power and rock products industries where moisture, dirt, abrasive dusts or corrosive atmospheres are a problem.

ALLIS-CHALMERS

A-5636



New Motor is

super-sealed

It's drip-proof — yet withstands moisture • abrasive dust • chemicals • high humidity • heat

The *Silco-Flex* system of insulation is used on all stators. Field coils of synchronous motors are bonded in heat-stabilized resins, enclosed in a resin-impregnated sheath of oriented glass fibers and bond-locked on the pole structure.

The superior electrical protection of Super-Sealed motors results from the insulating *system* used... not just the insulating material. The same material, conventionally applied, would retain certain weaknesses of conventional insulation.

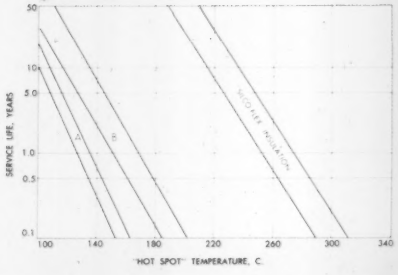
Applied the A-C way, it has these qualities that add reliability and service life:

Dimensionally stable — withstands heating, thermal shock, vibration and fatigue at elevated temperatures.

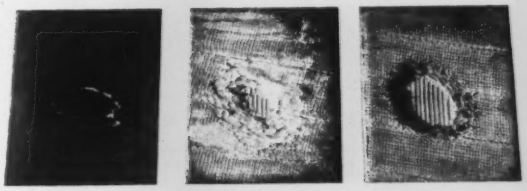
Sealed throughout — resistant to most chemicals, water, high humidity, weather, aging, corona and lubricants.

Homogeneous — provides a void-free dielectric barrier, homogeneous under extremes of differential expansion and contraction due to thermal cycling.

All Super-Sealed motors have revolutionary Silco-Flex insulation

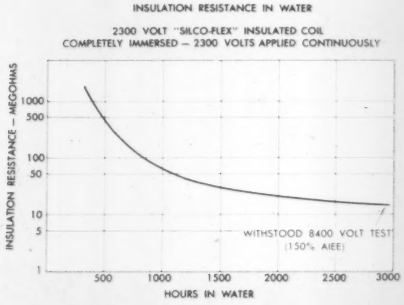


Heat resistant — *Silco-Flex* insulation gives much longer service life under higher temperatures than conventional materials.

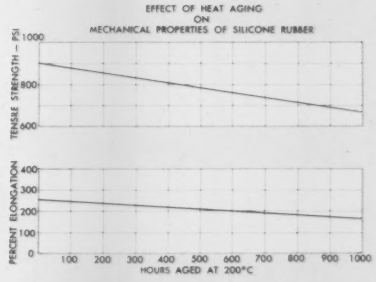


Silco-Flex Insulation | *Polyester Mica Tape* | *Asphaltum Mica Tape*

Abrasion resistant — Samples of insulation show effect after sandblasting for one minute with 90-grit aluminum oxide and 100-psi air. Nozzle to sample distance was six inches, thickness equivalent to 2300-volt insulation. Note difference in abrasion.



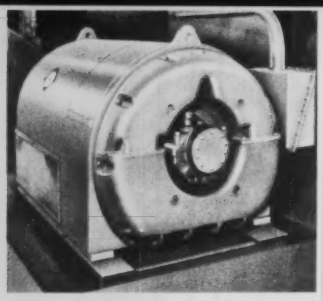
Moisture resistant — Test curve shows that *Silco-Flex* insulation, after 3000 hours of total immersion with 2300 volts impressed on coil, withstood high potential test of 8400 volts without injury.



Flexible, resilient — Rubbery *Silco-Flex* insulation remains flexible and resistant indefinitely. It is especially resistant to mechanical abuse and to stresses of overloading, rapid starting and stopping.

Silco-Flex is an Allis-Chalmers trademark.

ALLIS-CHALMERS



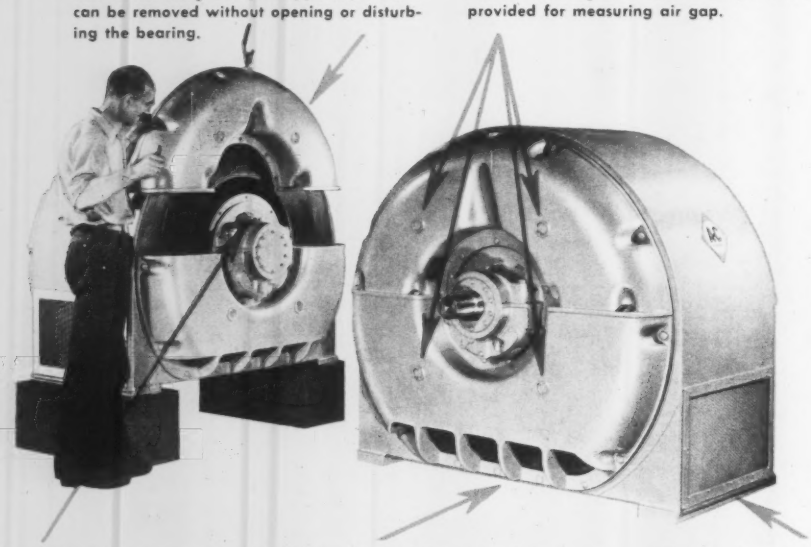
New Super-Sealed motors

10 mechanical features

Super-Sealed motors combine the perfect insulation with features that assure the mechanical as well as the electrical reliability of these motors.

Accessibility — Split-type end shields can be removed without opening or disturbing the bearing.

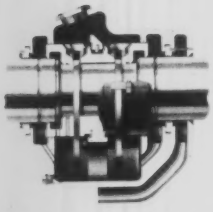
Ease of Inspection — Four points are provided for measuring air gap.



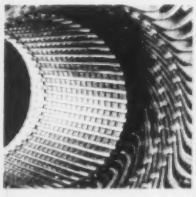
Clean Check — Glass inspection bulls-eye permits checking operation of oil rings without dirt falling inside bearing.

Full Circle of Protection — Steel plate across bottom of motor protects it from dirt and rodents.

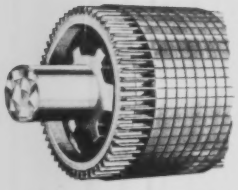
Clean Appearance — Foundation bolts are hidden, machine is clean-looking.



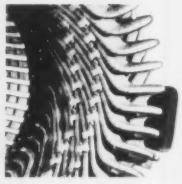
Self-Aligning Capsule-Type Bearings are center seated with single seat. Breather relieves pressure of oil in bearings that could cause leakage.



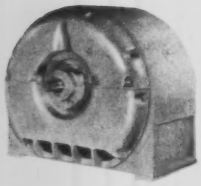
Precision Construction— Slot sticks are non-hygroscopic-trapezoidal, fabric base phenolic. End turns, spaced with polyester glass mat spacer pieces, are laced and tied with flat lubricated glass tubing for long trouble-free life.



Solid Construction—Silver-brazing rotor rods to end ring assures a good joint.



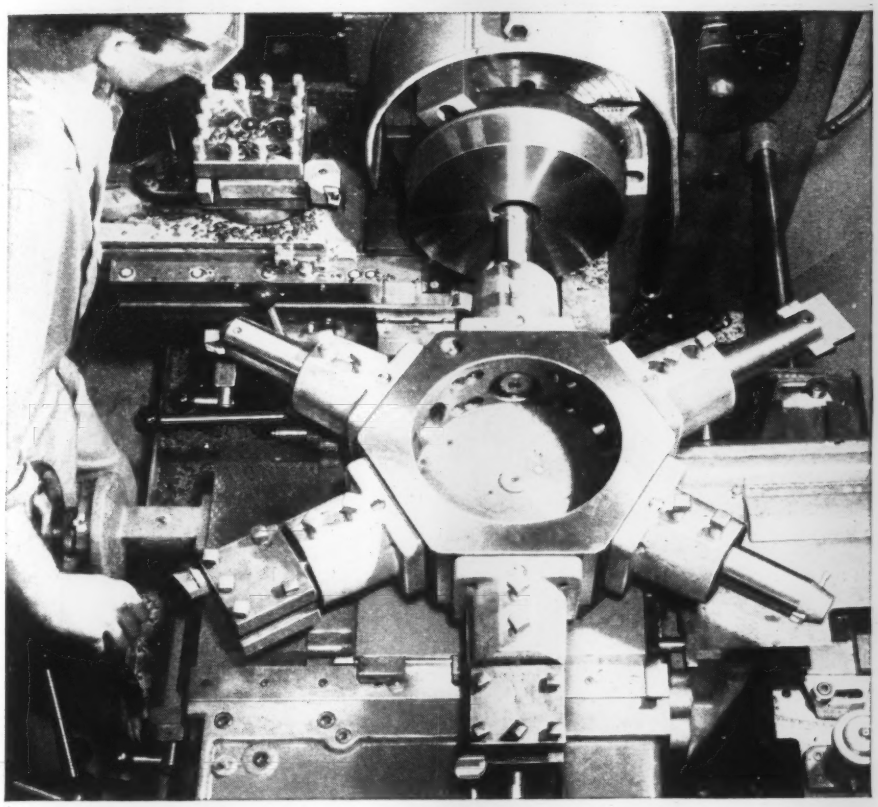
Rigid — End turns of higher speed motors are supported by insulated coil support rings to prevent injurious distortion due to high starting torque and frequent starting.

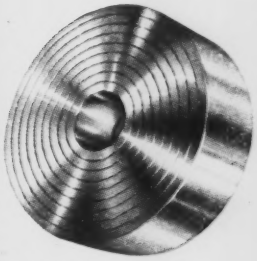


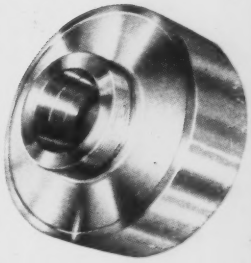
Timesavers—Separate plates provided to show direction of rotation and magnetic center. Terminal box is amply sized and diagonally split. Leads are brought out through grommet.

For the complete story, call your nearby A-C office or write Allis-Chalmers, Power Equipment Division, Milwaukee 1, Wisconsin.

ALLIS-CHALMERS







Expert setup gets more work per chucking

How manufacturer uses C/F turret lathe to produce variety of chuck bodies with only one tool change

To do the job, the manufacturer selected a Gisholt 1L Saddle Type Turret Lathe with a cross-feeding hexagon turret. A 15″ 3-jaw air chuck holds down chucking time. One set of adjustable serrated jaw bases handles the different workpiece sizes for first machining operations. A quick-indexing square turret on the cross slide carries turning, facing and chamfering tools, which work simultaneously with tools on the hexagon turret.

Three stub boring bars on the hex turret bore, counterbore, recess and back face. Because size is set with the cross-feeding turret, these same boring bars are used on different part sizes. Also on the hexagon turret are 2 box-type tool posts for facing, boring or recessing—used for different size workpieces because of the cross-feeding feature. A threading attachment lets the manufacturer thread the hubs, and a taper attachment handles up to 8 inches taper per foot when required.

The sixth tool on the hex turret, a spade cutter, is used for final sizing and is the only special tool changed for each job.

Simple, low-cost tooling combined with the cross-feeding hexagon turret offers maximum efficiency in handling various sizes of similar parts. The rugged Gisholt MASTERLINE Saddle Type Turret Lathes have the speeds, feeds and power to complete the work in the least amount of time. Call your Gisholt Representative today, or write Gisholt for literature.

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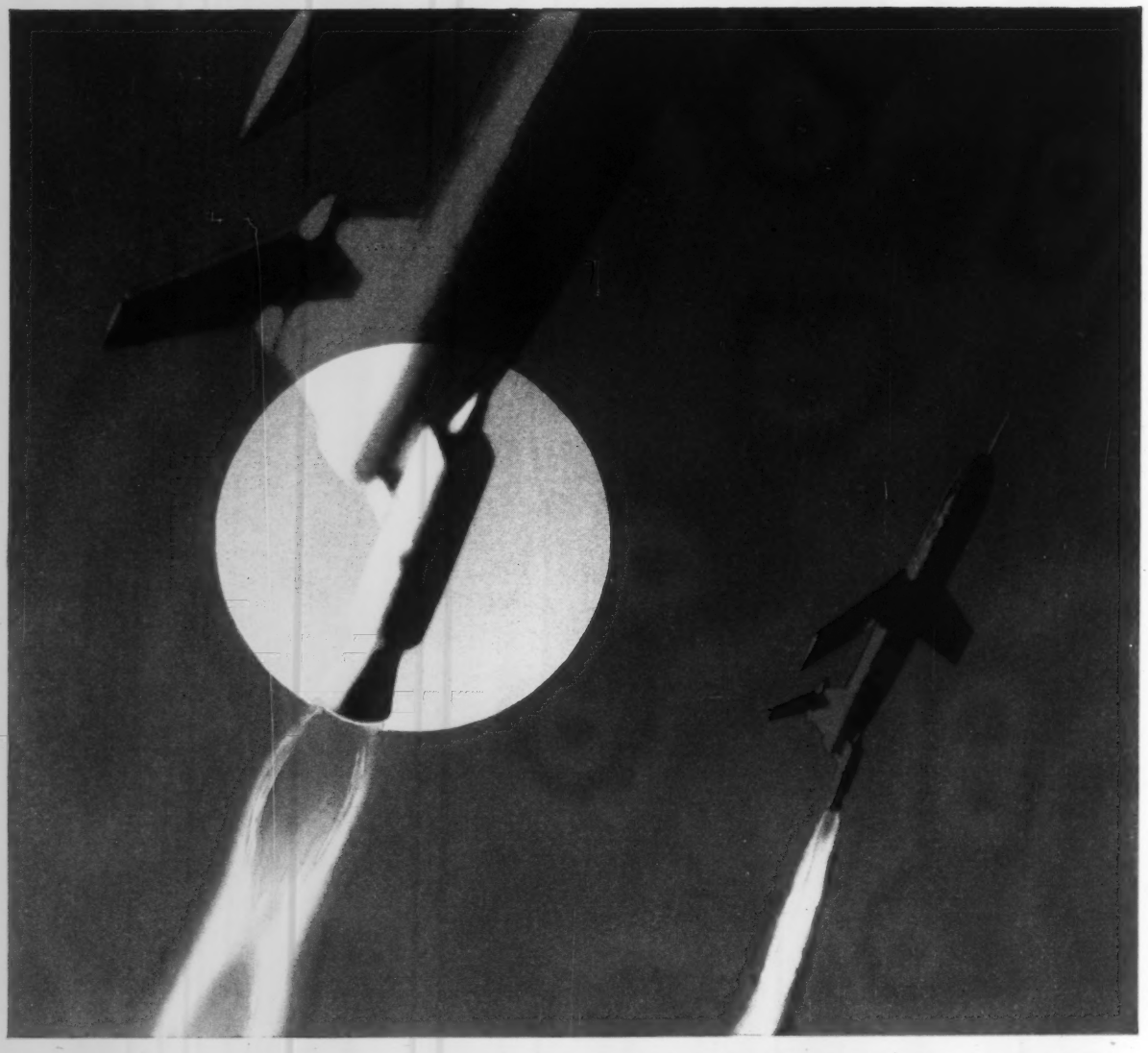

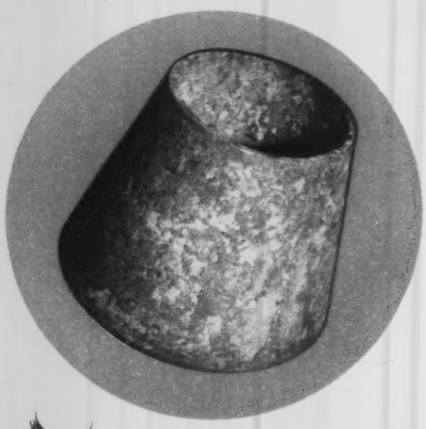

ONE-PIECE WELDED CONE FOR THE HOT SPOT

This is the vital nozzle cone of the Martin Mace guided missile. American Welding was able to form it in one piece from ¾-inch plate (FS-1020) and arc weld the joint to produce a tapered cone with a major diameter of 25 inches and a minor diameter of 15 inches. After heat treating and X-ray testing, it proved to be better and more economical than nozzle cones produced by the previous method of forming in two halves.

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AMERICAN WELDING

STEEL
March 10, 1958

Metalworking Outlook

Ford, GM Plan Small Cars for '60

Ford Motor Co. has a top secret crash program to bring out a small car in late 1959 for 1960 introduction. Prototypes are being tested. Ford hopes to release major body tooling by August, possibly sooner. If Ford is successful, GM will also bring out its small car for 1960—it's being tooled by its Holden subsidiary in Australia. The standard Holden is being revamped and will have parts interchangeable with those for the small car being tooled for import. Chevrolet has also costed out a small car for U. S. manufacture, but the GM division has not decided when or if it will release it for tooling and production.

Mr. Romney Keeps Quiet

George Romney, president of American Motors Corp., has made no direct overtures to the Justice Department about breaking up the big auto companies. At the Kefauver price hearings, he startled Detroit by his frank proposals. Justice officials immediately invited him to visit them. He never replied. Justice has made extensive studies of the competitive situation in autos and even has schemes that would result in smaller auto producing segments. The proposals won't be dusted off unless there's enough clamor and pressure to force the department to do so.

Machine Tool Orders Rise

Machine tool orders are rising slightly, but shipments are slipping. Net new orders for metal cutting types hit $19,350,000 in January, vs. $18,650,000 in December. February orders should exceed $20 million. Shipments in January slid to $47,950,000, vs. $56,150,000 the previous month. Look for shipments this year to reach about $506 million, compared with $843.9 million in 1957. National Machine Tool Builders' Association has just started reporting statistics on metal-forming types of machine tools. Net new orders in January reached $7.9 million, vs. $6.2 million in December. Shipments for the same months: $10 million, vs. $14 million.

Progress on Machine Tool Bill

A companion bill to S. 2595 has been introduced into the House (H.R. 10839) to set up a fund to keep Uncle Sam's tools in good shape and to buy new ones. An amendment has been added to the Senate bill to provide that funds may be made available from the sale of used tools, as well as from rentals, price concessions, and depreciation allowances. A Senate Armed Services Committee spokesman reports the bill went to the Defense Department for study last fall and hasn't been heard from since.

Tax Writeoffs Thawed for a Few

Office of Defense Mobilization is processing 329 applications for fast tax writeoffs, which have been frozen since last August. ODM expects to turn down most applications under new regulations, restricting writeoffs to production, research, and development connected with facilities for producing

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Metalworking Outlook

"new or specialized" weapons and their components for the Defense Department or Atomic Energy Commission.

Court Rules Ohio Firms Can Pay SUB

Despite a court O.K., unemployed steelworkers in Ohio cannot start drawing Supplemental Unemployment Benefits next week. A ruling by James Tichenor, Ohio Bureau of Unemployment Compensation administrator, that state jobless benefits would not be paid concurrently with SUB has tied up an estimated $4 million in SUB funds contributed by steel companies operating in Ohio. Erskine Maiden Jr., judge of the Mahoning County Common Pleas Court, overruled Mr. Tichenor. But the state official says he will appeal the decision. So, the matter will be tied up in the courts for many more months. Although the decision applies to steel only, it may serve to untie similar snarls in auto and other SUB cases in the state.

Negotiated Pay Boosts: 6.3 Cents

Wage settlements in the Cleveland area, a good barometer region, average 6.3 cents per hour thus far this year. Associated Industries of Cleveland reports that six of the 27 agreements provide for cost-of-living adjustments.

New Products in '60

Two-thirds of 1960 sales volume in the U. S. transportation industry (aircraft, shipbuilding, and railroads) could be in equipment unknown or unavailable as recently as 1956, estimates H. A. Toulmin Jr., chairman of Commonwealth Engineering Co., Dayton, Ohio. Electrical machinery, chemicals, and textiles are other major industries he cites in which 12 to 20 per cent of anticipated 1960 sales will come from developments still in the exploratory stage.

Euromarket Spurs European Business

Western Europe's business boom continues, due in part to the establishment of the common market Jan. 1. Anticipating new sales possibilities and lower tariffs, businessmen from West Germany, France, Italy, Belgium, Holland, and Luxembourg are building new plants in other countries, arranging new sales setups, generally exuding confidence which has even gone beyond the borders of Euromarket into Scandinavia, Britain, and Switzerland.

Straws in the Business Wind

National Association of Purchasing Agents says more members report job reductions than at any time since 1949 . . . But American Gear Manufacturers Association reveals the gearing industry had a 16.3 per cent increase in volume in January over December . . . New orders for industrial furnaces in January dropped to $3 million, 59 per cent under the 1957 January, says Industrial Heating Equipment Association . . . Shipments of the structural steel fabricating industry in January were 317,000, vs. 278,000 in December, says American Institute of Steel Construction.

"...and we saved again this month with help on purchasing from Ryerson"

More and more, cost-conscious management is receiving reports like this—as a direct result of dollar-stretching planned purchasing from Ryerson.

Buying cut-to-size steel the fast, convenient Ryerson way cuts your costs by making it safe to carry lower inventories. This, in turn, means reduced investment in equipment as well as materials—and cuts storage space, handling costs, scrap loss, taxes, etc. You're never overloaded . . . you're never caught short. You avoid jamming up smooth-flowing production lines . . . wrecking carefully calculated production schedules.

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The PROOF of DSC STEEL is in its PERFORMANCE ON YOUR JOB

How DSC *AccuRolled* STRIP is helping revolutionize the dining table industry

*Steelslides**

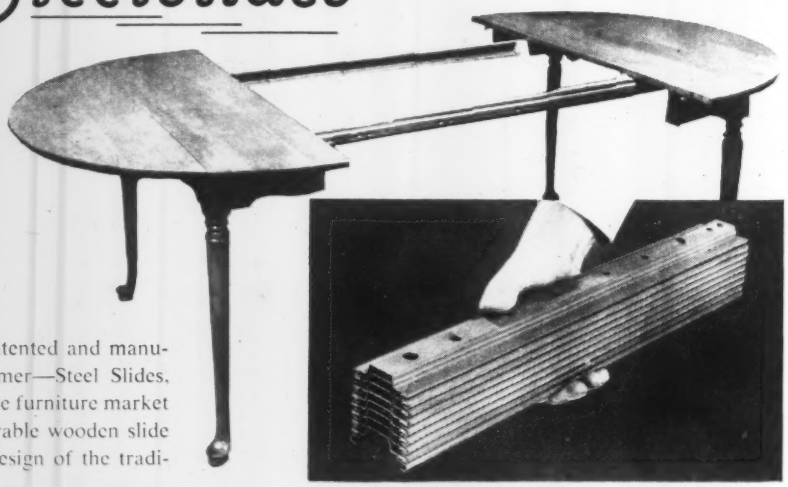

PHOTO COURTESY OF STEEL SLIDES, INC. AND PARKER RUST PROOF CO.

SUCCESS STORY—**Steelslides* are patented and manufactured exclusively by our good customer—Steel Slides, Inc., Yonkers, New York. Introduced to the furniture market in 1954, the idea has obsoleted the venerable wooden slide and revolutionized the basic structural design of the traditional extension table.

THE PRODUCT—Sliding members, torturously roll-formed from DSC *AccuRolled* STRIP, are fabricated into compact telescoping units that attach to the underside of the table top. These units interlock and overlap to form rigid, extensible, self-supporting "backbones." Extra legs and supports are outmoded.

END TO TABLE-STYLE TUG-OF-WAR—*Steelslides* slide snugly but effortlessly. Stops dining table tug-of-war. The secret: strictest control of materials and manufacturing tolerances; surfaces protectively conditioned with Parco Compound and Endurion (supplier: Parker Rust Proof Company, Detroit 11, Michigan); plus a final treatment to provide permanent, dry lubrication.

REASON FOR SUCCESS—Through a happy combination of mechanical and economic advantages, *Steelslides* help extension table makers improve the design and construction of their goods and reduce overall manufacturing costs in the bargain—a strong merchandising inducement.

THE ROLE OF DSC AccuRolled STRIP—The successful manufacture of STEEL SLIDES depends on high speed roll-forming and steel that can make the punishing deformations of the job. The key to performance is GAUGE AND TEMPER UNIFORMITY which DSC *AccuRolled* STRIP provides . . Here's the proof . . .

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Cold Rolled Carbon Steel Strip
Flat Cold Rolled Carbon Spring Steel

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Calling the Turn

While listening to Harvard's Sumner H. Slichter address the Associated Industries of Cleveland last week, we were sharply reminded that one of the trickiest assignments confronting management today is calling the turn in business.

Even the professor (regarded as one of the country's outstanding economists) admits that his crystal ball gazing failed him a year ago: He predicted that the then current lull would be followed by slow expansion, making the fourth quarter the best three months of the year.

As the professor now sees the outlook, the first quarter of 1958 marks the bottom of the current "recession." The recession, he observes, is pretty largely confined to a limited part of the economy—the production and sale of consumer durables, industrial equipment, industrial building, and related industries such as railroads and mining. The other and much larger part of the economy—the service industries, residential building, and government purchases of goods and services—are expanding.

The professor points to the usual factors that will contribute to a revival of the "downs." They include reductions in inventories, the easing of credit, government spending, and the continued high rate of personal income.

While we cannot accept the professor's prognostications with any more assurance than we did a year ago, there are several elements in the current picture that are almost dead certain.

Inflation is persisting in a period of apparent recession. Living costs and wages are edging upward, even though there are plenty of goods and unemployment is rising.

Inventories of raw materials and goods in process have been dropping for some time. Finished steel supplies, for instance, are estimated to be falling at the rate of a million tons a month.

The notion that we have a general and lasting excess of productive capacity is erroneous. Again using the steel industry as an example, capacity will be trailing population within two years. Plans are ready for another round of expansion.

As Professor Slichter says, the turn in business may be here. But whatever the timing, the turn is inevitable. It will arrive without fanfare. And it will reach some companies before it does others.

It's a good time to keep close check on two things: Inventories of materials and productive capacity. The smart company will be ready when the turn does come.

Irwin H. Such
EDITOR-IN-CHIEF

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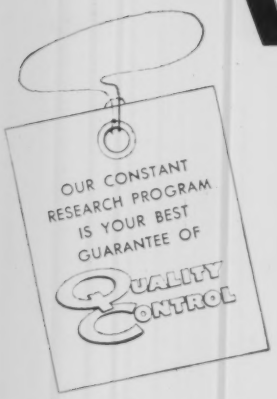
your "hourly" Assurance with

WYCKOFF

COLD FINISHED STEEL



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Modern Homes

Housing: How Much Help?

January was an exceptionally good month, but the industry's outlook for 1958 squares with that of business in general. Metalworking's share of market is on increase

WATCHERS of economic indicators had their hopes sparked by January home-building activity: 69,000 new nonfarm dwelling units were started then, government statistics show.

The figure is 7000 units above the December total and represents the largest December-to-January gain in seven years. It's 6000 units better than the January, 1957, mark.

Aside from that spark—and that's all it amounts to at the moment—the builders' outlook is similar to that of business generally. Here are two extremes being voiced:

From a January meeting of the National Association of Home Builders, an optimistic view: Albert M. Cole, U. S. housing administrator, predicted a 10 per cent gain over '57.

From a December meeting of the National Housing Center, a pessimistic forecast: Builders at the meeting felt that private home construction would be down 10 per cent —unless buyer confidence is restored.

The outlook shared by most of the industry: 950,000 private units plus 50,000 public housing starts in 1958. (That's appreciably below what the government and building associations are predicting.)

Pointing Up—Plus factors: Federal Reserve policies have eased the tight money situation which plagued builders a year ago. FHA lowered its down payment schedule and eliminated the requirement of paying cash for closing costs. (In effect, this concession further reduces down payments.) The GI loan guarantee program, scheduled to expire this year, has a good chance of being extended and possibly improved. And you can expect more public housing projects.

Pointing Down—The minus factors are tied to the general economy: Rising unemployment and reduced workweeks tend to make prospective buyers cautious.

Good for Metalmen—The bright spot for metalworking is that its stake in the home-building industry is growing. An estimated $3 billion annually goes into such home components as bath and kitchen fixtures and plumbing, heating systems, electric fixtures, wiring, and metal windows.

Big gainers in recent years have been metal kitchen cabinets, casement windows, storm doors and windows, garage doors, and rods or wire mesh for concrete foundations and drives.

Producers of such components (and appliance makers) are aggressively courting the prefabricated home manufacturer. Reasons: He offers a mass market sales opportunity; metalworking's potential, in both equipment and material, is a natural mass production aid for him.

And Prefab People — National Homes Corp., Lafayette, Ind., the nation's biggest prefabber, has a capacity of 290 units daily. Last year, it built over 17,000 homes—slightly exceeding its 1956 volume. Its homes feature aluminum windows, steel closet closures for utility rooms, and steel kitchen cabinets. About

60 per cent of its lower-priced models are shipped with complete plumbing.

Officials report they're experimenting with aluminum sandwich panels (in co-operation with Aluminum Co. of America) for roof sections and for interior walls with decorative designs.

U. S. Steel Homes, a division of U. S. Steel Corp., introduced a new prefab home a year ago in which 5 to 6 tons of steel are used (for framing, joists, roof trusses, gable ends, trim, and interior doors). The division also produces a wood prefab home in its New Albany, Ind., plant, but unofficial reports indicate it will soon be abandoned in favor of the Steelaire models.

Horizon Is Bright — Whatever home building's ills may be at the moment, the long-term outlook is rosy. Eugene P. Conser, executive vice president, National Association of Real Estate Boards, observes: Demolition takes an estimated 300,000 units off the market each year. Family formations continue at the rate of 1 million annually (and this will increase in the next ten years). At today's building rate, we're creating a yearly deficit of 200,000 homes.

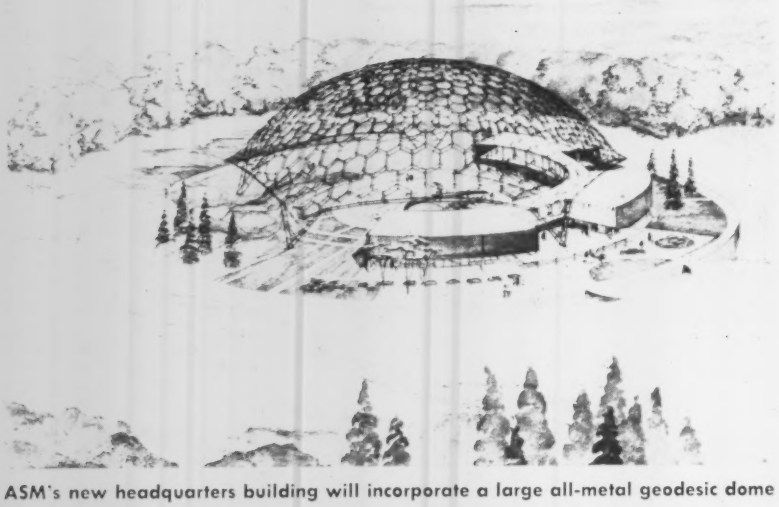
ASM To Start Tech Center

American Society for Metals will begin construction of new headquarters building in April. The structure will cost $2 million and should be completed in 1959

THE WORLD'S LARGEST "space lattice," a huge all-metal geodesic dome, will dominate the $2 million, semicircular headquarters building of the American Society for Metals. Its site: Russell and Newbury Townships, east of Cleveland. Construction will begin in April and is scheduled for completion by mid-1959.

The structure, to be erected on land presented to the society by William H. Eisenman, one of its founders and its national secretary for 40 years, is the first in a five-phase metal science educational program dedicated to the advancement of metals and the metal industry.

Into the construction of the new headquarters building will go a variety of metals to demonstrate their serviceability as well as the building uses to which they can be put.



ASM's new headquarters building will incorporate a large all-metal geodesic dome

Space Lattice — The geodesic dome, or space lattice, was designed by R. Buckminster Fuller, president of Synergetics Inc., Raleigh, N. C. It will be 250 ft in diameter and 103 ft high and will contain some 5¼ miles of aluminum tubing and 8 miles of tension rods. Best known Fuller dome in use today is the 93 ft one capping the Ford Rotunda in Dearborn, Mich.

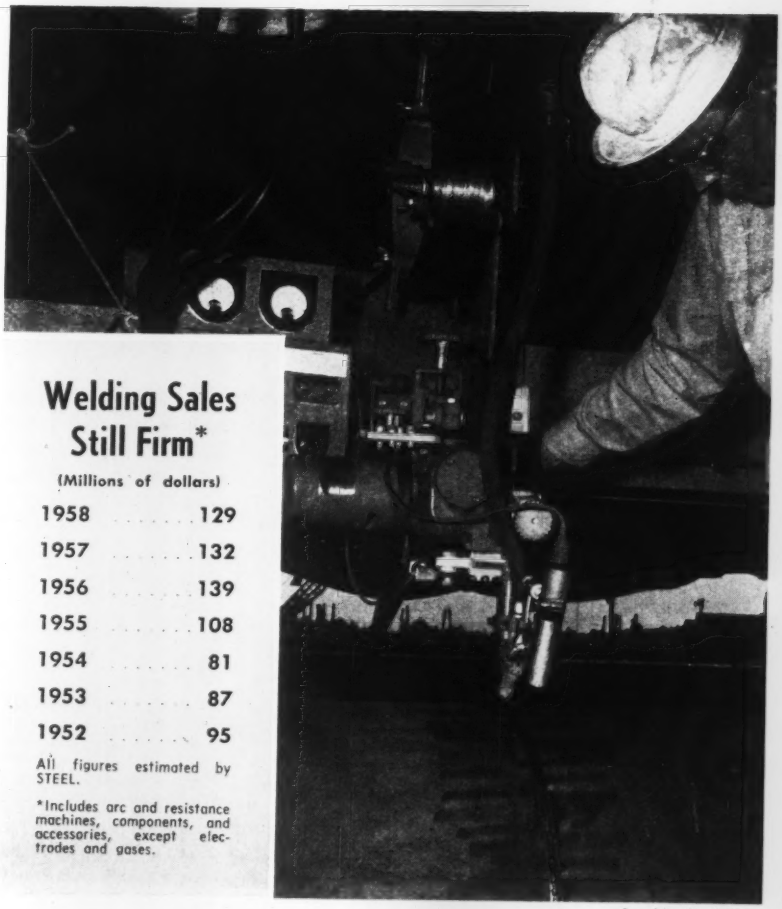
Actually a double dome (one within the other, 30 in. apart and weighing some 166,000 lb) it will form a one-quarter sphere designed as a skeleton of hexagons and pentagons with the appearance of an open-net honeycomb. It will stand on five support pylons with arches extending for 150 ft and rising 30 ft above the ground.

Headquarters Building — The three-level building will provide facilities for the ASM staff. Conforming to a semicircle, the building will be 240 ft around the outside face and will contain 50,000 sq ft. It was designed by John T. Kelly of the Cleveland firm of Kelly & Kress.

The building will contain a technical and engineering library, a dining area, and executive offices. Adjacent to the lobby will be an assembly room available for community and technical group meetings. It can accomodate 150 people. Other features will include a nonsectarian chapel, a 100 ft "mineral garden" in which samples of minerals in the natural state will be displayed, and a waterfall in the lower court area.

Concrete and Steel—Building materials for the structure will be primarily flat slabs of reinforced concrete mounted on exposed steel columns. A copper shield will extend around the perimeter of the third level to provide protection from the sun without interfering with vision.

Future Plans—The structure has been named Metal Park. Development plans call for special buildings that will eventually house the Metals Engineering Institute, a Metallurgical Seminar Institute, the Metals Research Institute, and a Metals Science University. Some $20 million is planned for science buildings alone.



Republic Steel Corp.

Welding Sales Still Firm*

(Millions of dollars)

1958	129
1957	132
1956	139
1955	108
1954	81
1953	87
1952	95

All figures estimated by STEEL.

*Includes arc and resistance machines, components, and accessories, except electrodes and gases.

Automatic Welding Climbs

That's the main reason for the welding equipment industry's steady sales. Sales gains of electric arc producers will counterbalance resistance welding's declines

WELDING longitudinal seams of mold boards for its big tractors has long been an automatic process at Findlay (Ohio) Div., Gar Wood Industries Inc. But, until recently, welding the transverse stiffeners onto the boards was a hand operation.

In a cost-cutting move, the division installed a Lincolnweld semiautomatic submerged arc Squirt welder. The total cost of changeover (including a fixture to handle the boards) was about $650. The new method has cut labor costs 30 to 50 per cent on each job and speeded production.

"Savings like that are the main reason for semiautomatic welding's mounting popularity," says Lincoln Electric Co.'s Charles Herbruck. "We're counting on sales of 'semiautomatics' to boost our dollar volume 10 per cent this year," says another welding machine producer. "Never before has management been so receptive to labor-saving devices," echoes a third.

Such emphasis on cost reduction was mentioned by respondents to STEEL's survey of electric arc and resistance welding equipment producers as the prime reason for a high sales volume in 1958 (see table, left). Most firms making electric arc equipment expect their dollar volume to increase this year, but manufacturers of resistance welders are nearly unanimous in predicting declining sales. Some resistance people are adding arc equipment to their product lines.

Arc Outlook Bright—Those two developments can probably be attributed to four factors: 1. The major markets for resistance welding (auto, sheet metal, and appliance industries) have been hit by slow sales years, while some big arc welding markets (pipelines, shipbuilding, construction, do-it-yourself) have continued at a rapid pace. 2. Arc welding is increasing its share of the total welding dollar. 3. New processes, like CO_2 welding, have expanded arc welding applications. 4. Arc welding has gained acceptance of building contractors.

So arc machine makers are moving along at a near-record pace. STEEL's survey finds them averaging a 42-hour week (vs. 40 hours a year ago) and 65 per cent of them have hired more workers. Most report that inquiries are above average, and seven out of ten say new orders are coming in faster than they did a year ago. About half say new order volume is greater than it was three months ago.

Resistance Pace Slows—Makers of resistance welding equipment (nearly all have reduced their work forces) are averaging a 40-hour workweek vs. 48 hours a year ago, the survey indicates. All respondents said their order pace was slower than it was a year ago. But some think the bottom has been reached: About half claim order volumes as good or better than they were three months ago.

Some look for an improvement in sales to the auto industry. They figure this way: One reason for motordom's poor showing this year is that the public doesn't like current styling. So some car divisions might push scheduled design

changes ahead a year. That would mean more retooling—more automatic resistance welders in production lines with accompanying jigs, fixtures, and accessories.

Another plus factor: With credit easier, home building should increase. That means a stepup in appliance sales, which, in turn, would improve resistance welding equipment turnover.

A few firms look for the steel industry to be their best resistance equipment customer this year. Their reasons: 1. That market hasn't been exploited as fully as the auto and appliance industries. 2. Steelmakers are adding new equipment to raise productivity.

Pointing Up—Shipbuilding, a large welding market, is on the rise. One yard has its first new contract since 1954. The *N.S. Savannah*, first nuclear-powered merchant ship, will be all-welded; atomic submarines are welded, too. In shipyards, portability of welding equipment is vital. Some firms (examples: Westinghouse Electric Corp. and Air Reduction Co.) are meeting that demand with a light welding gun featuring a built-in wire supply. Outdoor multiunit power sources, such as one just introduced by A. O. Smith Corp., also will get a good play in shipyards.

Road building, though still a small factor, is increasing its share of welding purchases. Welding people also expect an assist from the defense budget, says Hobart Bros. Co., Troy, Ohio. Missile and rocket spending will help, believe resistance welding equipment makers.

More Good Signs—With structural steel in ample supply for the first time in years, many welding people expect to enlarge their share of the construction dollar. The American Institute of Steel Construction is sponsoring projects to promote the advantages of steel over concrete. One idea getting attention is called "plastic design." It means designing a building close to the yield point of its structural members. Most observers figure that would expand welding's applications; others see it as an aid to high-strength bolt producers, or both.

M. O. Monsler, manager, Welding Div., Harnischfeger Corp., Milwaukee, brings up another point: The industry is selling electrodes at what is probably a record rate. That means a lot of companies are using old welding machines.

To save labor costs and improve weld quality, they'll soon be switching to new models. But right now, they're cautious: They ask for quotations, then want their options extended 30 or 60 days.

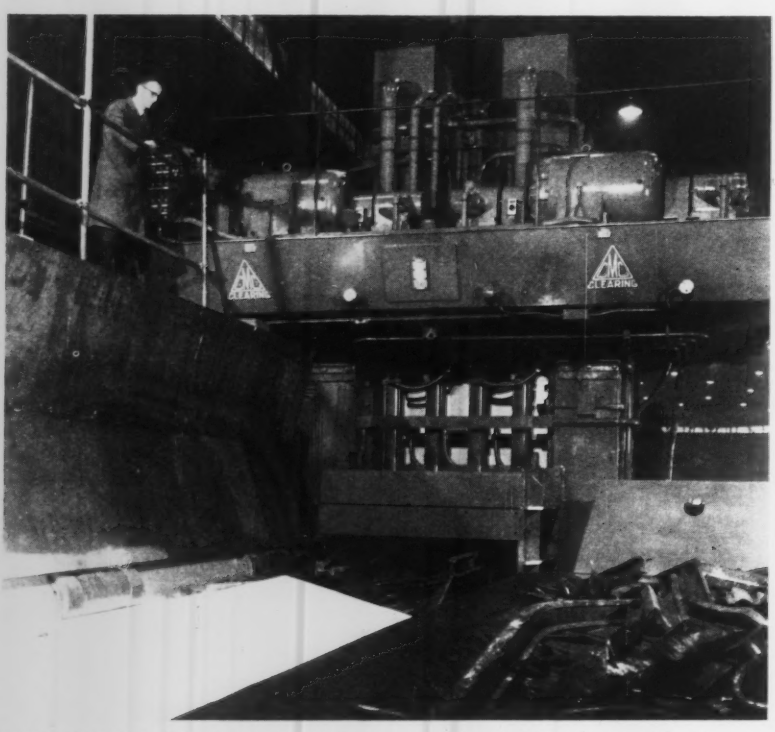
Pointing Down—The rail car outlook, once a welding mainstay, is grim. Declining plant and equipment expenditures force the welding people to rely more heavily on the replacement market. That means redoubling new product development efforts. Higher R&D costs, plus rising labor costs, cut into profits. But most firms expect their profit margins to hold near the '57 level which, they admit, was pretty good.

Most companies deny rumors of price cutting, but one midwest maker says he was underbid by 20 per cent on a February order.

Foreign Market—The majority of arc equipment people expect an improvement in export sales this year; the resistance people are split on that point (25 per cent look for an increase, 50 per cent look for a decrease, and 25 per cent expect to ship the same amount as last year).

But most companies agree that foreign competition is getting tougher in the export market. (Some firms are turning foreign customers over to their licensees and subsidiaries abroad.) Few have encountered foreign contention in the domestic market.

On the Horizon—All companies agree that the long term outlook for welding is a golden one. To back up their optimism, they point to new processes (like CO_2 and ultrasonic welding), new markets (like atomics, missiles, and the new metals), expanding markets (like construction), and possible new design trends (like unitized auto bodies and welded machine tools).



SCRAP SHEAR is 2½ stories high, has a capacity of 600 tons, and handles up to 30 tons of scrap per hour. Scrap is cut in equal lengths, adjustable in 6 in. increments. Range is 6 to 48 in. Clearing Machine Corp. Div. of U. S. Industries Inc. designed and built the unit. Clearing aims at steel mill, foundry, and scrap dealer markets

With plants and dealers linked, Clark Equipment Co. says . . .

Telegraph Speeds Delivery

TO SPEED DELIVERIES of new equipment and service parts to customers, Clark Equipment Co. has linked its ten plants and sales offices and 101 dealers with 13,000 miles of leased Western Union wire.

The system "will transmit three times as much information, three times as fast for the same amount we spent in telegraph and telephone service," estimates George Spatta, president. "We'll also be able to plan more efficient production."

Dealers will send messages over the wire to the communications center at Clark's home office in Buchanan, Mich. Operators will check the destination of the message and route it directly over one of eight circuits: Fork trucks and equipment to Industrial Truck Div., Battle Creek, Mich.; earth moving equipment to Construction Machinery Div., Benton Harbor, Mich.; and service part orders to Central Parts Div., Chicago. Clark's Canadian plants and dealers are also tied into the network.

Hard-To-Get Items — Besides speeding communications, the network serves as a clearing house for dealers when accessories or hard-to-get parts are needed. During preliminary tests a west coast dealer, who could not supply a customer with a steering axle for a 1942 fork truck, wired the communication center. All west coast dealers received the message. An axle was found by another dealer who shipped it to the customer within 24 hours.

Officials claim a principal advantage is elimination of repetitious dealer-company documents. The system includes automatic typewriters which make multiple copies.

Alan Wood Grows

Company's continuous growth program helps now and brightens outlook for the future

ALAN WOOD Steel Co.'s officials believe that the steelmaking capacity of the U. S. is not enough. "We expect that steel will again be in short supply and are planning to proceed with further enlargement of basic steelmaking facilities so that we will be able to meet the future needs of our customers," says Harleston R. Wood, president.

Expansion—Supporting these beliefs, the company is continuing its modernization and expansion program of the past decade. In the ten years ended Dec. 31, 1957, Alan Wood's capital expenditures totaled over $56 million. In 1957, the company spent over $6.5 million for additions and improvements, and $1,068,000 for mining development. These improvements added 20 per cent to blast furnace facilities, a second temper pass mill was added in the cold rolled department, a new office building was built, and Penco Div. (it makes shelving, cabinets, and lockers) moved into a new plant at Oaks, Pa. During 1957, the company produced 656,000 tons of ingots and had sales and operating revenues of $67.9 million. Net earnings were $2,054,000.

This year, the company is building a $3.6 million iron powder plant which will have a capacity of 50 tons per day. Alan Wood's operating rate for January and February, this year, was higher than the industry average, say Mr. Wood and John T. Whiting, chairman. This has enabled the company to build inventories of semi-finished products in anticipation of improved business.

Air Conditioning Sales Up

Big system air conditioning showed a larger gain during 1957 than any other part of the industry, says George S. Jones Jr., managing director of the Air Conditioning & Refrigeration Institute.

The installed cost of such systems is estimated at $598.9 million, vs. $528.2 million in 1956 and $434.1 million for 1955.

What It Takes To Launch Three Thors:

1 launch trailer, 65 ft long, with truck.

2 nitrogen storage and transfer trailers, each 20 ft long.

1 tank trailer (the trailers below are rectangular; this one is a tank), 5 ft long.

1 hydropneumatic trailer, 20 ft long.

2 liquid oxygen equipment storage and transfer trailers (rectangular), 20 ft long.

1 electrical equipment trailer, 20 ft long.

1 air conditioning trailer, 10 ft long.

1 power pack launching mount trailer, 8 ft long.

1 electrical substation trailer, 5 ft long.

1 missile checkout trailer, 20 ft long.

1 mating equipment trailer, 15 ft long.

1 power distribution trailer, 20 ft long.

4 diesel-electric generating trailers, each 20 ft long.

1 launch control trailer, 20 ft long.

1 flatbed truck, 15 ft long, for cargo transfer.

1 storage tank for liquid oxygen, 40 ft long.

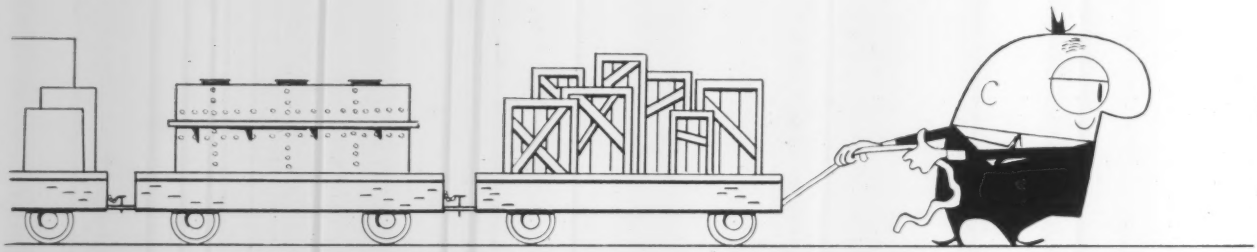
1 storage tank for fuel, 15 ft long.

1 diesel fuel storage tank, 10 ft long.

3 sheds for the missiles, each 65 ft long.

4 fuel transfer sheds, each 5 ft long.

Tractors to pull all the trailers. Number is determined by speed needed and distance from the site.



Missile Market Includes 'Birds,' Parts, Plus

LAUNCHING sites for missiles may turn out to be good business for metalworking.

For example, the cost of an Atlas launching site will be close to $100 million (STEEL's estimate). Almost 40 per cent of the outlay will be in direct ground support equipment (such as electronic gear, fuel storage, and transfer facilities). Here's a breakdown of costs (including ten Atlas missiles at $2 million each, but excluding development costs) that's based on information released by Lt. Gen. C. S. Irvine, Air Force deputy chief of staff for materiel, at an Air Force Association meeting in Washington.

	(Millions)
Missiles	$20
Spare parts at site	10
Ground support equipment	40
Technical facilities	30

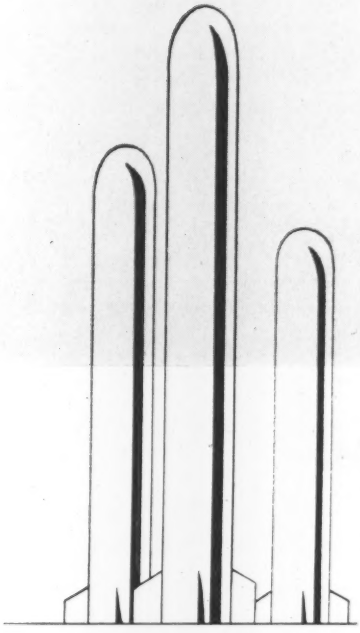
The Thor Complex—In the case of a smaller missile, the Thor IRBM, the AF exhibited the equipment neccessary to launch and move it from one site to another. Besides the huge trailer needed to move the 65-ft bird from its shed to the launching pad and raise it to firing position, about 20 other trailers, each about 20 ft long, carry fuel and mobile electrical and electronic equipment for three firings.

Industries directly involved in the Thor complex will include makers of material handling machines; hydraulic, pneumatic, electrical, and electronic equipment; liquid oxygen and nitrogen equipment; air conditioning; diesel generation; fuel storage tanks; metal building materials; communication equipment; and maintenance equipment.

The Big Question—How do you get a share of the business? The Thor launch suppliers are already set, says Robert L. Johnson, assistant chief missile engineer, Douglas Aircraft Co. Inc. But an Avco Mfg. Corp. spokesman (contractor for the Titan ICBM nose cone), notes his firm is now contracting for launching equipment. That missile is scheduled to be operational in 1960.

Weapon System Policy — The policy of the AF: "Concurrent with production of the missiles, associate contractors are required to design all the ground handling and ground support equipment related to their specific subsystems," says General Irvine. Engine contractors arrange for fuel storage and transfer equipment; guidance system contractors handle electronic support.

Even if you missed the first contracts, you will have plenty of op-



Launch Sites

portunities to qualify. Our ballistic missile program is well on its way. Potential contractors of ground support equipment should concentrate on the newer missiles, like the Titan, the Army's Pershing and the Minute Man, a new solid-fuel ICBM to be contracted for by the AF.

Continuous Business?—If you can get in on the ground floor of this business, you might have an easier time than you would expect: Mr. Johnson believes that future missiles ("second generation" IRBMs and ICBMs) will tend to be designed within the concept of the original launching system. (Another observer disagrees: He feels that missiles and their launching complexes will leapfrog ahead, rather than develop slowly.)

The Army, according to Maj. Gen. John Daley, special weapons director, may move ahead more conservatively. Its solid-fueled Pershing will not be a descendant of the Jupiter IRBM, but the service's pride in the interchangeability of Redstone and Jupiter components indicates developments in the 1960s may stem closely from the Pershing.

If you're in on the Navy's Polaris IRBM program, you may consider yourself in a favorable position with all three services because of the current swing to solid fuels. But Maj. Gen. Bernard Schriever, AF ballistic missile division commander, discounts the extent of the trend. He doesn't believe there will be a complete switch to solid fuels in the next decade. However, industry executives at the AFA conference thought solid fuels have the biggest future in missiles.

Multiplicity of Birds — General Schriever told the conference the AF deliberately brought up two ICBMs to provide competition within the aircraft-missile industry and to get a diversity of birds. That may keep more firms in the field, but it also cuts profit potential. ICBM production will be "in the order of" B-52 production, says Peter Schenk, General Electric Co.'s consultant on defense matters. Another observer guesses only about 500 Titans will ever be built.

"The day is long gone when we will produce thousands of similar systems over a period of four or five years," sums up General Irvine. Indicating a continuation of the AF philosophy of building many types of missiles, he adds: "Contracts will probably be spread over a wider base than is the case now."

Aircraft, Too — Manned aircraft will be with us for a long time, conference participants agreed. They will become manned spacecraft by the time you expect them to be completely outmoded by missiles.

No hint was given of the ratio of manned aircraft to missiles in the Strategic Air Command of the 1960s—although Mr. Schenk indicated that bombers would be with us until the early 1970s. Subsonic Snark missiles of intercontinental range are "much more potent" than generally believed, says Mr. Schenk. They will be phased into SAC in quantity in the '60s. Some are operational now. They'll cost about $600,000 each if they are ordered in quantity.

More Black Boxes—Whether aircraft, missiles, or spacecraft are involved, the emphasis is on cost cutting. Subsystems will tend to be sealed units (black boxes), so they may be removed from a weapons system and returned to the factory for repair, or thrown away.

Panelists of the AFA conference disagreed on the relative cost of ground support for liquid and solid fuel systems because solids require special x-ray testing equipment on the spot, says George Sutton, chief of preliminary design, Rocketdyne Div., North American Aviation Co.

Missile Longevity—Dr. George Valley, chief scientist for the AF, expects that "we will have to expend a sizable portion of our missile stockpile (when we have it) every year" because missiles wear out when they are idle. That may partly compensate for a missile's lack of hardware. A manned bomber, for example, has three or four times as many vacuum tubes and associated hardware as a ballistic missile.

Repeat business must always depend upon how fast newer missiles come up, and, in the AF view, they'll come as fast as Congress provides the money. The only limitation will be the state of the missile art.

Spare parts on hand will tend to be less for missiles than aircraft, points out Gen. E. W. Rawlings, Air Materiel Command chief. "Speed of communication and rapid transportation will be substituted for the higher stock levels and pipelines characteristic of manned aircraft." On hand at each site will be stocks sufficient to launch the missiles, plus whatever is determined for a "normal repair cycle." What the AF needs on hand remains to be determined because even the Matador, the oldest operational missile, hasn't been in combat units long enough "for sound advance provisioning." As accelerated firing times are demanded by the enemy's capabilities, the general believes ground support costs will tend to go up: "More launchers per missile, more check-out equipment, and higher speed fueling equipment will be needed."

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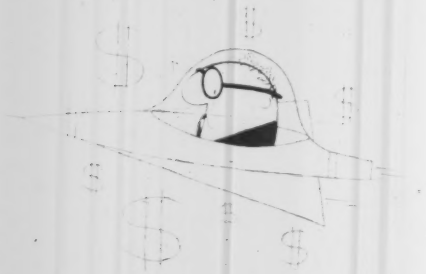

Is Space Worth the Cost?

TOP ADMINISTRATION leaders, Democrats determined to make political hay, and missile industry executives are considering a big question these days: How much should Uncle Sam spend to get into space? A shot to the moon and a reconnaissance satellite are the least of their worries. They are possible now. The big decisions concern such projects as a manned expedition to Mars and a permanent station on the moon. They may take years to develop, but a decision to begin has to be made now.

One of the most well-informed men outside of the President's cabinet and the Central Intelligence Agency offers some guides for decision making. He is Dr. Simon Ramo, president, Space Technology Laboratories Div., Ramo-Wooldridge Corp., technical supervisor for the Air Force's ballistic missile program.

'It Is Difficult To Be Objective'

With the emotional overtones of Russian space successes, it is difficult to be objective about our space program, admits Dr. Ramo. Added to that, the explorer instinct in man demands that we rush out as far as we can, as soon as we can.

The catch: "It is not certain a dollar spent in exploring outer space will buy us more security in the short or long term than a dollar spent in other scientific fields also closely associated with military potential," Dr. Ramo says. Admitting that his own imagination tends to run away with him when he considers the possibilities of space exploration, Dr. Ramo believes at least equal consideration must be given to money for research on such things as more reliable and cheaper earth-bound ballistic missiles, weather control, better communication systems, controlled thermonuclear energy, or a cure for cancer.

With infinite ways to spend money, space offers a "candy store" in which to spend our research dollars, he says. No one nation can buy all the kinds and control space for itself. It's better to escape from the earth just often enough and do a lot of other things on earth besides.

Faced with possible psychological results of a first Russian landing on the moon, Dr. Ramo backtracks to comment: "A space experiment does have the advantage of being conspicuous." Summing up, he says: "Let us carefully distinguish between an urgent program of experiments and a crash program based on the idea that the need to conquer space is self-evident."

Keep Calm About Tax Cuts

Talk of tax cuts is like Asian flu: It's catching, but fleeting, in most cases. Both parties talk about several plans on Capitol Hill, but their leaders are keeping an eye on corporate profits. With defense appropriations soaring (the second supplemental for over $1.5 billion is due soon), neither party is likely to advocate a deficit for fiscal 1959, based solely on the results of a premature tax cutting this year. Both parties had hoped corporate receipts would go up enough to pay for personal tax cuts.

The need for increased consumer income via the tax cut road is not a foolproof argument, most observers agree, especially if unemployment is held below 6 million. As a percentage of total working force, fewer are unemployed today than in 1949.

Patman Committee Takes a Stand

Rep. Wright Patman (D., Tex.), who is not particularly noted for his serenity, led his Joint Economic Committee in recommending that fiscal action and increased federal spending be used before tax cuts to drag the nation out of its slump.

Sen. Paul Douglas (D., Ill.) was the only member of the committee dissenting.

Decision on S. 11 This Week?

The Senate Judiciary Committee tried last week to get a vote on S. 11, authored by Sen. Estes Kefauver (D., Tenn.), but the meeting merely produced "discussions" of the bill, reports a committee spokesman. The bill, subject of some of the most intensive lobbying ever to hit Capitol Hill, would prevent manufacturers from selling to retailers in the same area at different prices—if it results in decreased competition.

The committee doesn't have to bring the bill to vote, of course, but chances are it will be reported favorably. The lineup looks like this: Six committee members in favor of it, three opposed, and six uncertain. Interestingly enough, the first order of today's committee meeting (Mar. 10) will not be S. 11.

If S. 11 gets out of committee, says Representative Patman, sponsor of a companion measure in the House, the outlook for passage by Congress is promising.

Capitol Notes

Senator Kefauver's Antitrust Subcommittee asked the Justice Department and Federal Trade Commission to check steel industry pricing practices for violations of the antitrust laws . . . The Nike missile system can be translated into modern air traffic control system by 1963, says James T. Pyle, administrator, Civil Aeronautics Administration.

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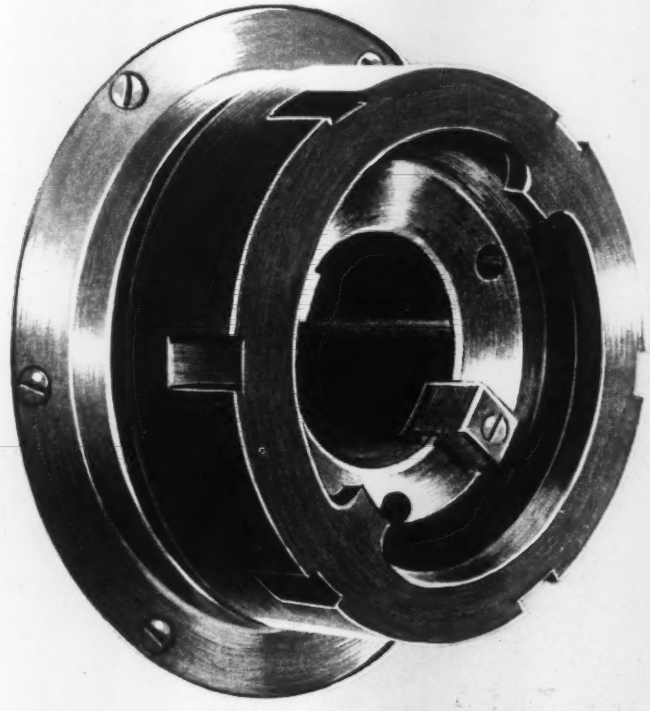

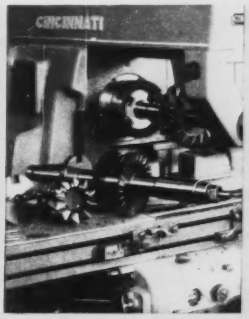

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Offices in Principal Cities

Fringes Up Europe's Costs

U. S. manufacturer cites example of Italian workers: They get 12 paid holidays, 17 other days off, plus such standard things as insurance, sick leaves, and retirement benefits

EUROPEAN LABOR gets liberal fringe benefits, reports a U. S. manufacturer on return from a tour abroad.

For example, fringe benefits add 40 to nearly 60 per cent to the annual wage bill of many European bearingmakers, reports A. B. Williamson, vice president and plant manager, Bearing Div., McGill Mfg. Co. Inc., Valparaiso, Ind.

"I was amazed to learn that in Italy workers are given 12 paid holidays, plus 17 other days off," he says. "This is in addition to other usual benefits, such as insurance, sick leave, and retirement plans."

He found two important results of low wage rates: More inspection and less automatic handling equipment, compared with U. S. plants.

Inspection Thorough — Plants in Europe can afford to do certain operations that are not economical in this country, Mr. Williamson says.

"They can, and do, inspect green dimensions of parts 100 per cent. There were even examples of 100 per cent hardness inspection of general production. We, of course, must rely on quality control to maintain certain tolerances because our higher wage scales forbid 100 per cent inspection."

Conveyors Scarce—He saw a few examples of good conveyor systems, "but they are in the minority." Labor for handling costs about 25 cents an hour in Europe, six to eight times under costs in the U. S. This obviates automatic handling equipment in most plants abroad.

Despite this, he found bearingmakers abroad in the process of extensive modernization aimed at getting a larger slice of world markets.

"Generally, European manufacturers are behind the U. S. in manufacturing techniques but are rapidly modernizing their plants in production methods," Mr. Williamson asserts. Production equipment made in the U. S. is in general use in all European bearing plants. Mr. Williamson's tour included Germany, Austria, Italy, France, and England.

Labor Scarce — Mr. Williamson also notes an acute labor shortage in some parts of Europe. One manufacturer built de luxe apartments for workers and provided bus service to and from work.

"European living standards are well behind those here," Mr. Williamson says. "But the people are willing to extend themselves to change that. European economy is on the upswing and production is strained to keep up with consumption."

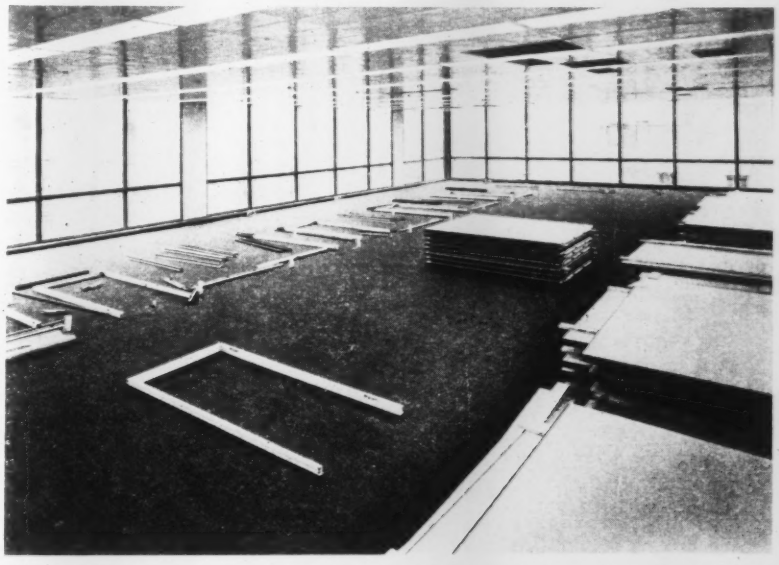
Practices Differ—He says many U. S.-made screw machines are in use, but that tubing is a scarce commodity. Much trepanning of bar stock is done to obtain both outer and inner races. Otherwise, standard tubes are OD-turned on lathes before being fed to screw machines. Another practice common is forging races with large presses, then turning them on single and multiple spindle machines. Carbide tooling is used on single-spindle chucking type lathes.

Exports to Poland Soar

Increased trade with Poland caused U. S. exports to eastern Europe to take a sharp upturn in the first nine months of 1957. The annual rate hit an eight-year high.

Secretary of Commerce Sinclair Weeks says that U. S. shipments to the USSR and other eastern European countries were valued at $40,764,000, vs. $8,808,000 in the same period of 1956. About $29 million worth of goods went to Poland.

Secretary Weeks says that the shipments to eastern Europe accounted for less than 3 per cent of U. S. exports ($14.1 billion) for the period. In 1947, shipments to eastern Europe totaled $339.9 million. By 1952-53, they had dropped to a low of $1.4 million. The government has loosened restrictions on export licensing policies, particularly on surplus agricultural commodities which are subsidized by the government.



MOVABLE INTERIOR WALLS on column-free floors provide the Inland Steel Bldg., Chicago, with a "totally useful" interior. It's said to be the first major office building in the U. S. to be so constructed. Floors can be divided into offices of the exact size needed. Shifts can be made as needs change. Shown are sections of the prefabricated wall system stacked in rows prior to erection. Made by E. F. Hauserman Co., Cleveland, the walls utilize extruded aluminum posts and panels of baked enamel on steel

Do-It-Yourself Market Has Broad Economic Base. Here's One Breakdown:

Per cent of families engaged each year in one or more of the activities listed at the right, by income group:

$2000-2999	63.9%
3000-3999	72.1
4000-4999	82.0
5000-6999	79.8
7000-9999	79.2
10,000 and over	60.1

Black & Decker Mfg. Co.

Want To Crack Do-It-Yourself Market?

You can sell an industrial product as is, adapt it, or make something new. You'll need marketing knowhow to succeed, but the rewards are great—especially during a recession

THERE'S a $15-billion market for do-it-yourself items, and it's especially important today. At a time when metalworking's shipments to industry are off sharply, sales to the home handyman and hobbyist are holding steady or even picking up.

"Do it yourself is the hottest thing I've seen in a long time," says Frederick O. Robbins, management consultant for Robert Heller & Associates Inc., Cleveland. "It looks almost depression-proof."

Here's Why—During periods of economic distress, people are more interested than ever in saving money by doing their own painting, plumbing, carpentry, and electrical work. Not only do they make their own repairs, but they sometimes supplement dwindling incomes by turning out simple products for sale. This means increased prosperity for manufacturers of workshop power tools. A spokesman for the industry describes his business as "a sort of economic night blooming flower."

Now several years old, the do-it-yourself movement has lost much of its novelty but none of its punch. The National Retail Hardware Association, Indianapolis, estimates that its 23,814 member stores can trace 37 per cent of their sales to home handymen and hobbyists. Best moving hardware items: Hanging shelf brackets, sliding door tracks, wrought iron and brass legs for furniture. William S. Orkin, New York promoter and home show manager, says the trend is toward outdoor activities for the whole family, such as boating, cooking, and gardening.

Things To Consider—If you're going to enter the do-it-yourself market, you'll want to consider: 1. Whether you can offer the consumer a product you're now making for industry. 2. Whether you must simplify your product, make it lighter or less expensive. 3. Whether you should create a new product. 4. How you'll promote it. 5. What channels of distribution you'll use.

In launching a product, your objectives are twofold: First, to let people know that it exists (which may require advertising in consumer media and the preparation of point-of-sale displays). Second, to make sure it's available when people ask for it (which will require your salesmen or distributors to set up a network of dealers).

As Labor Costs Rise, Amateurs Try Many Jobs

Per cent of families engaged each year in the most popular projects:

Inside painting	45.8%
Carpentry	24.5
Outside painting	24.3
Plumbing repairs	20.2
Furniture constr., repairs	15.8
Laying linoleum, tile	15.8
Remodeling rooms	7.6
Wallpapering	7.2
Construction of additions	5.8
Insulation	4.9
Cement and concrete work	4.6
Elect. work (ex. appliances)	4.3

Here's How:

Hazards—What you have to remember is that selling to consumers involves a lot of merchandising. It costs money (the page rate in a consumer magazine might be $16,000 or more), and it takes time. Management may want results before results can be produced.

If your salesmen are accustomed to calling on big industrial customers and selling in carload lots, they probably won't find time for the nickel and dime accounts. You may have to set up a retail sales force.

If you assign the sales task to a wholesale hardware distributor, your product will be just another page in his big book. How can you be sure he'll push it?

Once you've placed your product in a retail outlet, it will have to fight for counter space. You can't expect store salesmen to do much selling for you, so you'll have to give your product a package that says "please pick me up." To give you an idea of what point-of-sale displays cost, Black & Decker Mfg. Co., Towson, Md., invests $500 in a store fixture for power tool accessories. To encourage self-service by retail customers, Lamson & Sessions Co., Cleveland, provides dealers with an elaborate bolt and nut merchandiser.

Selling Direct—One way to keep a tight rein on your distribution system is to sell direct. Heath Co., Benton Harbor, Mich., mails electronic equipment in kit form to its customers. Depending entirely on catalogs and fliers, it has no sales force. Trindl Products Ltd., Chicago, advertises a do-it-yourself welder in *Popular Science*, offers it for $98.50, f.o.b. factory.

Trial Balloon—In 1952, a big midwestern manufacturer of industrial fasteners probed the retail market for packaged nuts, bolts, and screws. It ran 3-in., one-column ads in the handicraft magazines, offering a selection of fasteners for 95 cents. "We got a tremendous response," says a company spokesman. "A year later, we wrote to the buyers, asking what they thought of our assortment (they liked it) and our price (they recommended 79 cents). Then we prepared counter displays and went into a retail chain.

"Unfortunately, the results weren't up to our expectations. We had to buy plated screws, packaging was expensive, and our salesmen were too busy calling on original equipment manufacturers to bother with retail accounts. We're convinced that there's a market, but we're not going back into it until we've fully exploited the industrial field. You've got to sell a zillion fasteners at retail to make any money."

By Chance — Reynolds Metals Co., Louisville, got into the do-it-yourself market four years ago as the result of a remodeling operation in its sales offices: A company official noticed that a carpenter was cutting aluminum with a regular handsaw. Today, Reynolds' aluminum is sold in racks displayed by more than 14,000 dealers and serviced by 275 distributors.

By Design—American Industrial Products Co., Cleveland steel warehouse, entered the do-it-yourself field because it wanted protection against the fluctuations of industrial buying. Ben B. Baker, president, and Sol J. Stark, vice president, decided to offer short lengths of soft steel to the home handyman. Their Handi-Steel Mill (a rack like Reynolds') contains rounds, flats, angles, thread rods, and galvanized sheets. Handled by wholesale distributors and displayed in about 2500 stores, it accounts for nearly a fourth of company billings.

Selling As Is—Emerson Electric Mfg. Co., St. Louis, offers the layman his choice of 21 motor designs from ¼ to 1 hp. "Most of them were selected from the regular line we sell to appliance manufacturers," says O. D. Metz, manager of motor sales. "We're making an effort to get into the nooks and crannies where motors are sold by sixes and tens. So far, the results look pretty good."

Taking advantage of the boom in high fidelity sound equipment, Utica Drop Forge & Tool Div. of Kelsey-Hayes Co., Utica, N. Y., offers the kit builder a line of "hi-fi tools." Some are standard. Others were developed for the electronics industry.

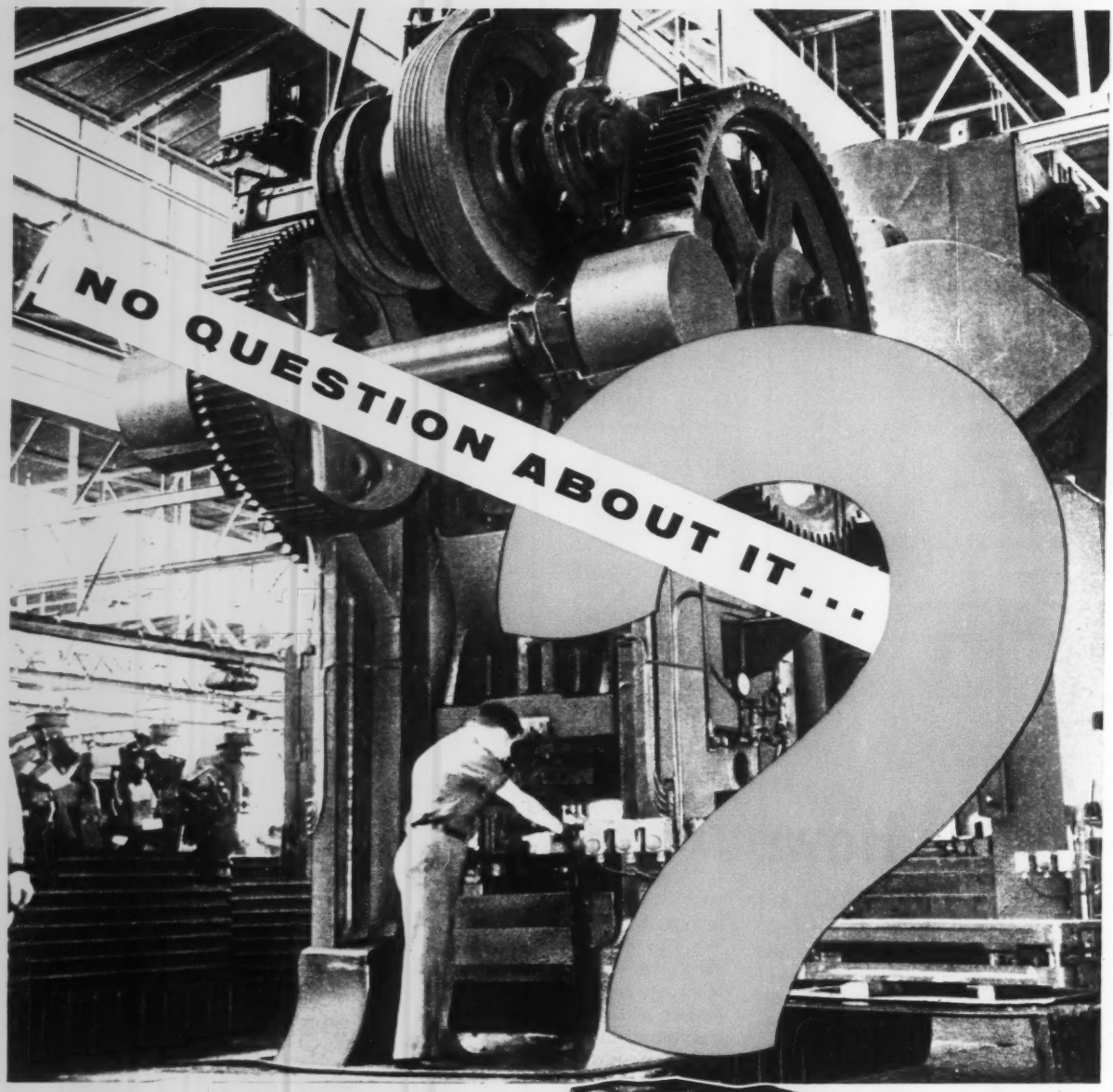
By Adaptation—American Floor Machinery Co., Toledo, Ohio, made a bid for the do-it-yourself trade several years ago when it came out with a lightweight version of the machine it sells to contract floor sanders. No housewife would rent a machine from her local hardware store if she couldn't carry it to her car, the company realized.

Something New—In 1955, Bulldog Electric Products Co., Detroit, a division of I-T-E Circuit Breaker Co., brought out an electrical plug-in strip which provides additional outlets for lamps and appliances. For two years, it employed the channels of distribution normally used in selling industrial power transmission equipment.

When it became apparent that distributors and contractors weren't moving much Electrostrip, Bulldog decided to make a pitch for the residential market.

Although it feared that retail distribution might antagonize contractors, Bulldog made Electrostrip available to hardware stores last fall. To date, only one contractor has complained.

• *An extra copy of this article is available until supply is exhausted. Write Editorial Service,* STEEL, *Penton Bldg., Cleveland 13, Ohio.*



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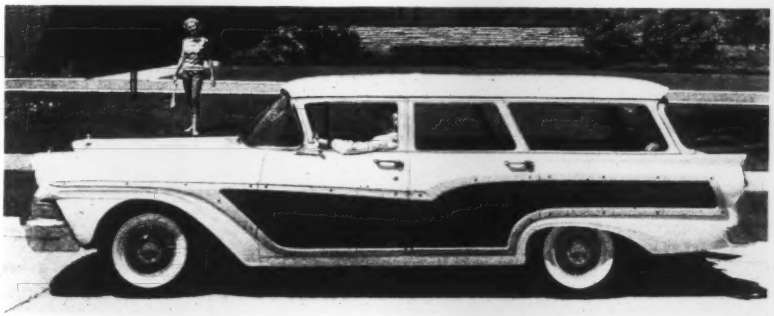

Ford's wagons are designed for style and ruggedness, and . .

Chevrolet combines rakishness and roominess. Trends are . .

Bigger Markets for Wagons

REGARDLESS of how many cars are sold this year, station wagons will get at least 14 per cent of the market. If 5.5 million cars are produced, wagon sales will come to about 770,000 units.

This year, when economy counts, low priced wagons seem to be more popular than ever. While total sales are down, Ford and Plymouth indicate that the percentage of station wagon sales is considerably higher than it was last year. One Chevrolet official estimates wagons will account for 20 per cent of its '58 sales.

Studebaker-Packard Corp. is making its bid with the Scotsman Wagon. It incorporates two removable metal side panels that fit over the side rear windows, turning the vehicle into a panel truck. Advertised delivered price is $2088.

Trends—The carry-all car has come a long way since the first one was built in 1903 by Stearns Steam Carriage Co., Syracuse, N. Y. Stearns's four-passenger Model H cost $1200. Only a few hundred were sold—primarily for use as delivery trucks.

Even as late as 1948, station wagons took only 2 per cent of the industry volume. Now they're close to 14 per cent. If industry thinking is correct, sales should level off at 15 to 16 per cent of the total volume.

Two-Doors Dropped — In 1956, just under half the 712,000 wagons manufactured were two-door models. Last year, only 199,000 of the 843,500 wagons built were of the two-door variety, says *Ward's Automotive Reports.*

This year, only Mercury and Dodge offer two-door models. Pontiac quit after 1957, and rumor has it that Mercury may drop out by midyear. It's likely that all 1959s will be of the four-door variety.

Problems—Stylish as they may be, station wagons are still a compromise between a car and a truck. This causes problems. We've been testing the Ford, Chevrolet, and Plymouth wagons pictured here, and gas consumption is high. Around town, unloaded, none did better than 10.5 mpg.

Some of the gas consumption undoubtedly was due to cold weath-

Wagon Output

	(Thousands)	% of Total Production
1958*	770	14.0
1957	843.5	13.6
1956	712.2	11.3
1955	580	8.2
1954	310	6.5

*Estimated by STEEL on basis of 5.5 million cars. Source: *Ward's Automotive Reports.*

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er starting conditions, but part of it stems from gear ratios and V-8 engines which are designed to handle heavier loads than passenger cars. Acceleration is slightly slower. With higher torques, we noticed a tendency toward rear end swing on the take-off.

Suspension—We think the 1958 station wagons ride better than the '57s. Plymouth's Torsion-Aire suspension is particularly good. This model also seems to offer the best solution to the jigsaw puzzle of folding rear seats into a cargo deck.

The Plymouth Sport Suburban has the third seat facing the rear.

SAE Talk — "Consumer studies indicate station wagon buyers want style and ruggedness," reports D. C. Woods, Ford Div. exterior design stylist.

Speaking at the Society of Automotive Engineers' body and materials meeting in Detroit last week, Mr. Woods claims: "There have been some attempts in station wagon design to 'passenger car' them too much. This was true of the Chevrolet Nomad and Pontiac Safari body shells in 1955, '56, and '57. This hardtop styling with a rakish rear end was good looking but apparently unsuccessful. General Motors discontinued the body style for 1958."

Mr. Woods to the contrary, reports have it that Pontiac and Chevrolet are returning to the hardtop design used by Buick and Oldsmobile. GM plans two lines of wagons for each of its divisions next year. They'll have retractable rear glass now found in Plymouth's Sport Suburban.

Approaches—Detroit has different theories about station wagon design. "Chrysler Corp. has tooled up a single body shell in two and four door versions for all lines, and each uses its own front end sheet metal," explains Mr. Woods.

This method may seem less costly, but designers and body engineers face expensive headaches in adapting divisional styling treatments to a common body.

"General Motors, Ford, and the Little Two pattern their wagons after the car lines they represent. A Ford station wagon has quarter panel and rear end treatments similar to the passenger car. In the Chrysler line, the quarter panel may be much different from its mate in the passenger car field," says Mr. Woods.

Doors—A big difference between wagons is the type of door interchangeability they have. To cut tooling costs, it's necessary to use passenger car components, and the door is one of the costliest to tool.

Station wagons use a passenger car front door, but most of them have a different rear door because the drip line on a wagon goes straight back from the windshield to accommodate third seat passengers. Exceptions to this are the six-passenger Rambler and Buick-Oldsmobile body shells which use front and rear passenger car doors. With no third seat, and no headroom problem, these roof lines can drop.

Future — Looking ahead, Mr. Woods predicts: "We certainly will be seeing sliding or roll top roofs; the panels going back into the roof or the roll top being similar to the old roll top desks. Aluminum or light plastic strips will retract into a center roller."

He also indicates that, since the station wagon market has grown to more than half a million units annually, someone is apt to divorce the wagon from its regular car line and bring out a model designed for carrying capacity, good appearance, and ruggedness.

European manufacturers may do this. The small rear engine type of wagon could be built on 180 in. over-all length and still accommodate nine persons if the driver sits over the front wheels, Mr. Woods believes. Volkswagen's Microbus and Fiat's Multipla are examples of van-type station wagons being imported.

General Motors has just announced Pontiac Div. will offer a six-passenger Vauxhall Victor station wagon this spring. Made in England, it has an over-all length of 167.5 in. and a 98 in. wheelbase. The vehicle is powered by a 4 cylinder, 54 horsepower engine. Ford began importing its English-built Escort and Squire wagons last year.

U. S. Auto Output

Passenger Only	1958	1957
January	489,357	641,591
February	393,360†	571,098
2 Mo. Total	882,717†	1,212,689
March		578,826
April		549,239
May		531,365
June		500,271
July		495,629
August		524,354
September		284,265
October		327,362
November		578,601
December		534,714
Total		6,117,315

Week Ended	1958	1957
Feb. 1	104,359	140,411
Feb. 8	109,028	147,163
Feb. 15	101,656	145,846
Feb. 22	89,977	138,938
Mar. 1	91,196†	140,362
Mar. 8	90,000*	140,161

Source: *Ward's Automotive Reports.* †Preliminary. *Estimated by STEEL.

Odds Change on Strike

Autodom's capital is betting 6 to 5 that there'll be a strike when auto contracts expire June 1. Until a few weeks ago, odds were 3 to 1 the UAW would walk out.

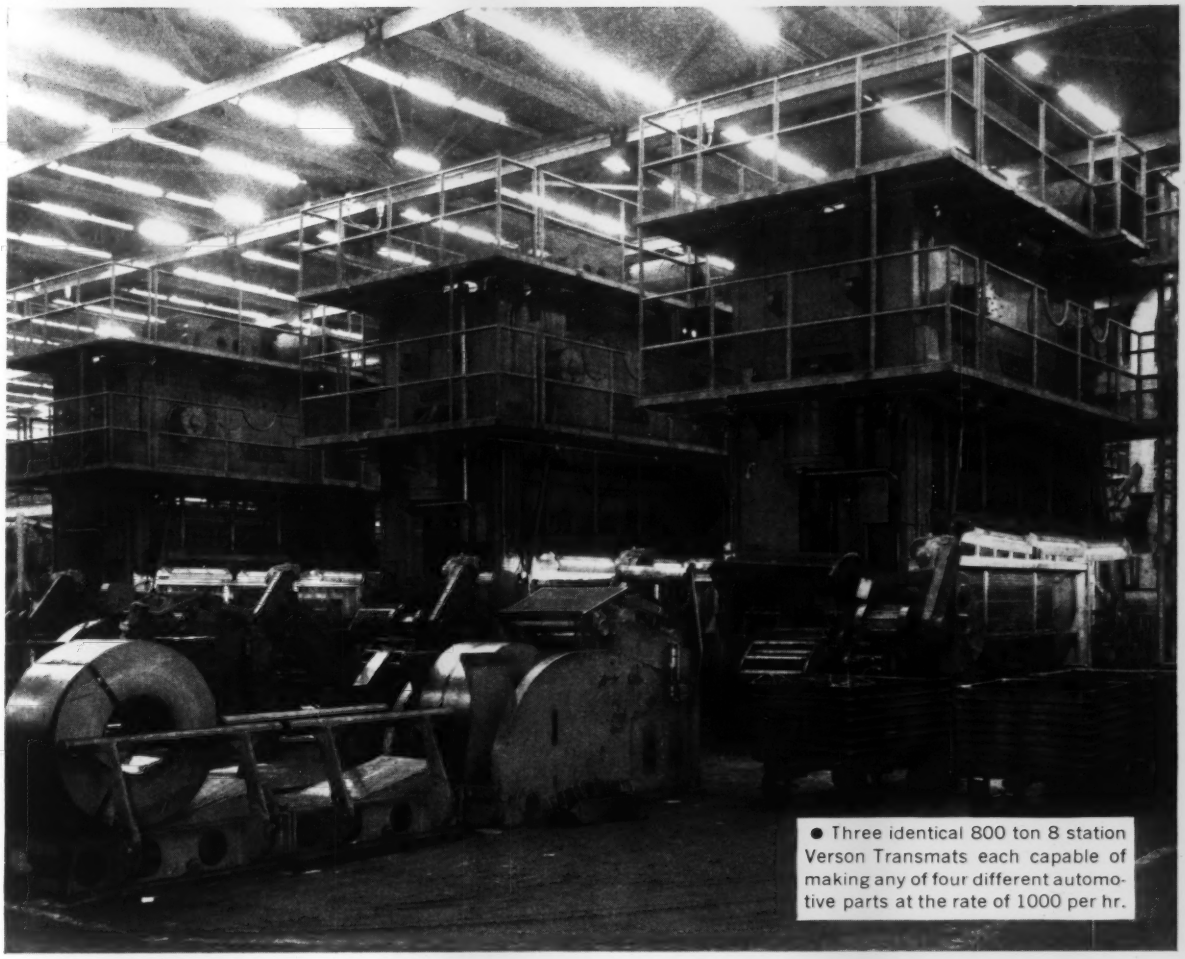
The change in attitude may be wishful thinking on the part of Detroit industrialists, but one labor seer puts it this way: "The question has always been whether management could afford a strike. It's hard to realize the situation is reversed. The companies can afford a strike this year—but can the union?"

With over 200,000 workers idle in Detroit, union officials are hinting they want Mr. Reuther to accept any honorable settlement enabling men still working to stay on the job. The recent refusal of a Pontiac UAW local to strike against speedup demands emphasizes worker attitudes. So does the union's refusal to strike against Chrysler over a similar dispute.

Sequel — The auto companies, whose dealer inventories are more than adequate to carry them through a strike, may force Mr. Reuther to walk out anyway.

Explains one company man: "It might be better to have the men strike, furnishing an outlet for all their gripes. If there's a peaceful settlement, many workers are likely to nurse grudges, thinking we took advantage of the times to force an unfair settlement on them. A strike would act as a purgative."

The UAW and General Motors announce bargaining will begin Mar. 25 at 1 p.m. in the GM building in Detroit. Ford Motor Co. starts negotiations Mar. 31.



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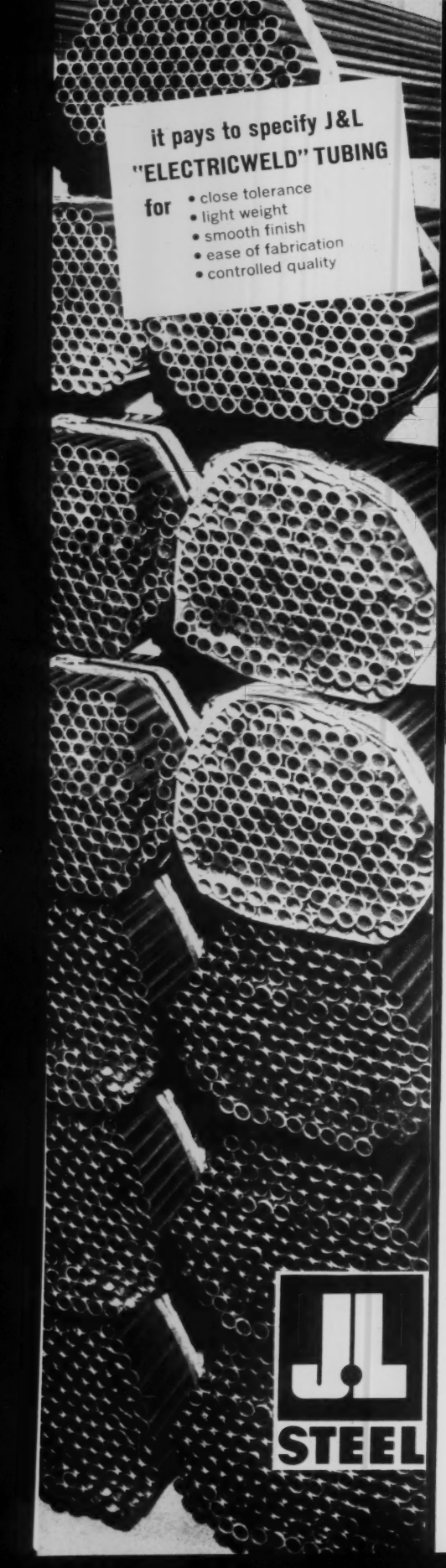

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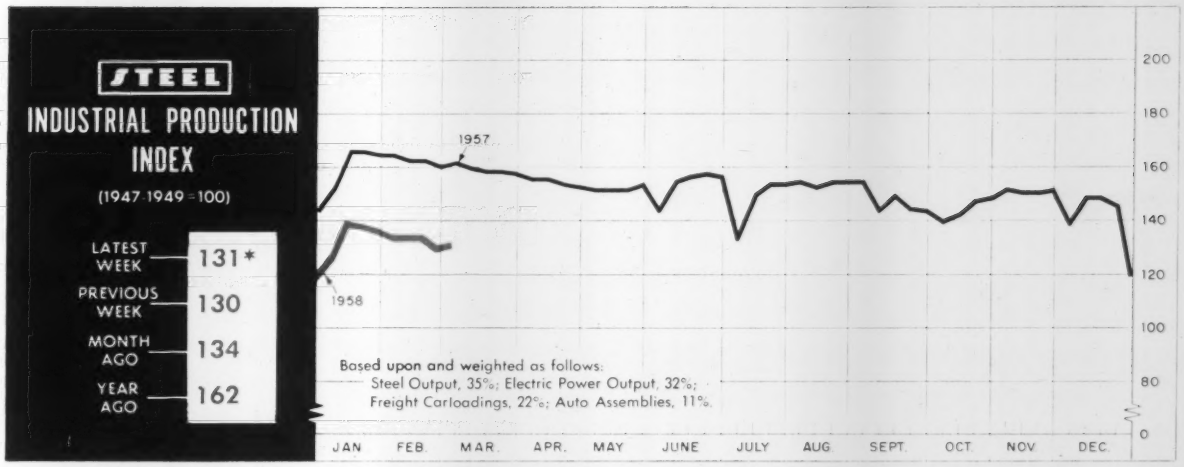

Week ended Mar. 1.

Slichter Sees Improvement Next Quarter

IT WILL be about another six months before a significant upward push is noticed in the economy. In the interim, the over-all trend will be pretty flat at about its present level.

That's the outlook Sumner H. Slichter, one of America's top-flight economists, gave at the annual meeting of Associated Industries of Cleveland last week. "In the present quarter, production is at the annual rate of about $429 billion, a drop of less than $4 billion below the last quarter of 1957," Mr. Slichter states. (Gross national product in the last quarter of '57 is estimated at $432.6 billion, a drop of $7.4 billion from the third quarter rate.)

Business should improve slightly in the second and third quarters, but many persons will not recognize a real upturn until later.

High Consumption—Mr. Slichter points out that spending for goods has continued on its lofty plane during this decline in production. "Buying of goods, including net foreign investment, may be estimated at around $434 billion a year—about $5 billion more than the current rate of production and only $2 billion a year (or less than half of 1 per cent) below the all-time high of the third quarter of 1957.

"The recession is pretty largely confined to . . . production and sale of consumer durables, industrial equipment and industrial building, and to related industries such as railroads and mining. Other and much larger parts of the economy —the service industries, residential building, and government purchases of goods and services—are expanding. The expanding parts of the economy . . . are more than two and a half times as large as the contracting parts."

Bucking the Trend—He believes the consumer is largely responsible for the basic strength of the economy. Personal income in January was less than 1 per cent below the all-time peak in August, 1957. Re-

BAROMETERS OF BUSINESS

	LATEST PERIOD*	PRIOR WEEK	YEAR AGO
INDUSTRY			
Steel Ingot Production (1000 net tons)[2]	1,419[1]	1,475	2,411
Electric Power Distributed (million kw-hr)	12,200[1]	12,338	11,791
Bituminous Coal Output (1000 tons)	6,795[1]	7,965	9,850
Crude Oil Production (daily avg—1000 bbl)	6,800[1]	6,808	7,519
Construction Volume (*ENR*—millions)	$304.7	$338.5	$321.2
Auto, Truck Output, U. S., Canada (*Ward's*)	117,673[1]	114,930	172,816
TRADE			
Freight Carloadings (1000 cars)	500[1]	492	704
Business Failures (Dun & Bradstreet)	317	319	300
Currency in Circulation (millions)[3]	$30,543	$30,642	$30,544
Dept. Store Sales (changes from year ago)[3]	−18%	−6%	+3%
FINANCE			
Bank Clearings (Dun & Bradstreet, millions)	$20,884	$25,276	$19,516
Federal Gross Debt (billions)	$274.9	$274.4	$276.2
Bond Volume, NYSE (millions)	$19.8	$23.0	$17.6
Stocks Sales, NYSE (thousands of shares)	8,623	9,201	8,259
Loans and Investments (billions)[4]	$87.0	$87.2	$85.1
U. S. Govt. Obligations Held (billions)[4]	$26.5	$26.3	$25.8
PRICES			
STEEL's Finished Steel Price Index[5]	239.15	239.15	227.10
STEEL's Nonferrous Metal Price Index[6]	201.7	201.7	239.1
All Commodities[7]	119.2[1]	119.1	116.9
Commodities Other than Farm & Foods[7]	125.8[1]	125.8	125.4

*Dates on request. [1]Preliminary. [2]Weekly capacities, net tons: 1958, 2,699,173; 1957, 2,559,490. [3]Federal Reserve Board. [4]Member banks, Federal Reserve System. [5]1935-39=100. [6]1936-39=100. [7]Bureau of Labor Statistics Index, 1947-49=100.

Value Analysis On Fasteners and Small Parts

Shows Cold Heading Usually Cuts Costs

This may well be the age of "Value Analysis". And, one of the most promising fields for such a cost saving study is fasteners and small parts. Actually one of the most important cost cutting developments in recent years is the increasing use of cold headed parts and fasteners in place of more expensive and structurally weaker screw machine products.

The more expensive bar stock used in the screw machine method results in considerable waste, whereas the waste is almost negligible in cold heading.

Another important consideration is the greater strength structure of parts made by the cold heading method. The blow of the heading tool causes the grain structure of the metal to flow in lines of greater strength.

The possibilities of cold heading are almost unlimited when used in conjunction with secondary operations. The tremendous savings in operation and material costs make it a must consideration when designing small parts either as fasteners or as integral units for manufactured parts. It has been a long time policy of John Hassall, Inc. to support their cold heading equipment with the latest methods of secondary manufacture. Machines for roll threading, slotting, drilling, tapping and many other operations are available for your profit.

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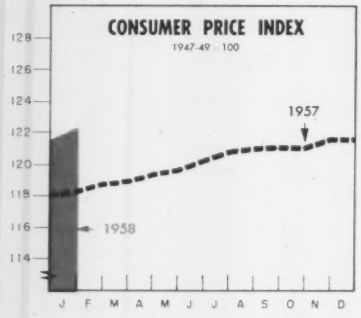
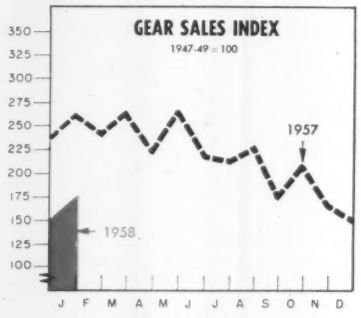




	1958	1957	1956
Jan.	122.3	118.2	114.6
Feb.	....	118.7	114.6
Mar.	....	118.9	114.7
Apr.	....	119.3	114.9
May	....	119.6	115.4
June	....	120.2	116.2
July	....	120.8	117.0
Aug.	....	121.0	116.8
Sept.	....	121.1	117.1
Oct.	....	121.1	117.7
Nov.	....	121.6	117.8
Dec.	....	121.6	118.0

U. S. Bureau of Labor Statistics.

	1958	1957	1956	1955
Jan.	174.5	259.3	245.5	140.9
Feb.	....	239.5	256.2	148.5
Mar.	....	262.4	276.5	172.8
Apr.	....	221.7	264.7	179.8
May	....	263.2	275.6	205.2
June	....	215.9	245.4	193.5
July	....	211.4	286.7	201.7
Aug.	....	225.8	219.5	217.6
Sept.	....	174.9	230.5	246.5
Oct.	....	207.0	299.8	227.6
Nov.	....	165.3	216.2	210.4
Dec.	....	150.8	235.7	245.5
Avg	....	216.4	254.4	198.3

American Gear Mfrs. Assn.

Charts copyright, 1958, STEEL.

tail sales that month were only 0.4 per cent below the peak of last July; they were above November-December marks, seasonally adjusted.

(Cleveland auto dealers will attest to the ability of the public to spend. During a special Auto Week, dealers sold 3300 new cars, vs. only 2565 in the preceding three weeks. A good percentage of the buyers paid cash. Down payments on financed deals were unusually large. But Mr. Slichter holds a dim view of motordom's prospects for 1958 and 1959. Sales prediction for this year: 4.5 million cars. Prospects for 1959: Not much better.)

Cites Six Duration Factors

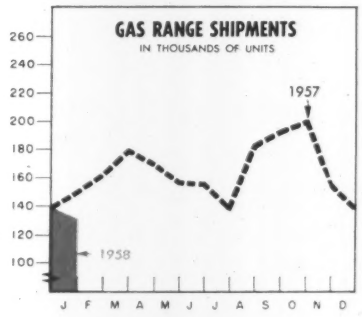
The duration of the recession and the size of the upturn will depend upon the balance among six principal elements in government spending and gross private investment: Federal purchases of goods and services; state and local government spending; housing; inventory investment; plant and equipment expenditures; and net foreign investment.

Local, state, and federal governments will increase their combined spending rates by about $1.5 billion a year from the first to second quarters. While defense orders will rise during the first half of this year, they will not be translated into production until at least the second half.

Bright Spot—Housing starts have been uptrending without interruption since last June. Mr. Slichter believes the trend will continue with an increase of about $500 million a quarter. (This may be a big factor in reversing the trend of consumer spending away from durable goods.)

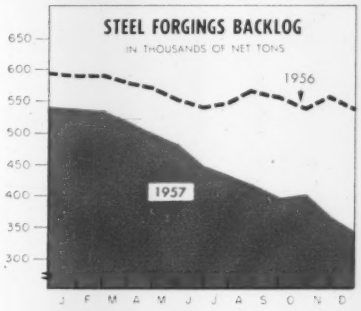
Inventories are being liquidated at an annual rate of about $5 billion or $6 billion, Mr. Slichter estimates. "The fact that disinvestment in inventories has been going on at a rapid rate raises doubts as to whether it will continue much longer at this same rate. A drop in the rate of disinvestment in inventories would be an influence for expansion." That drop will be to about a $3 billion annual rate, he believes, or a plus value of $2 billion, annual rate.

Even though investment in plant and equipment in January was still running at a high rate, this segment is in a declining trend. Such spending in the second quarter may be $3 billion a year below outlays in



	Shipments—Units		
	1958	1957	1956
Jan.	129,900	149,600	163,500
Feb.	.....	161,600	190,200
Mar.	.....	179,400	194,300
Apr.	.....	168,800	176,300
May	.....	156,200	179,400
June	.....	155,300	185,100
July	.....	137,400	158,800
Aug.	.....	182,600	203,200
Sept.	.....	192,100	206,400
Oct.	.....	195,500	219,100
Nov.	.....	154,300	161,100
Dec.	.....	138,100*	138,700
Totals	.....	1,970,900*	2,176,100

*Preliminary.
Gas Appliance Mfrs. Assn.



	Shipments		Unfilled Orders	
	1957	1956	1957	1956
Jan.	148	160	537	589
Feb.	135	152	533	589
Mar.	146	159	517	578
Apr.	139	150	497	569
May	135	151	479	551
June	128	143	445	540
July	104	98	431	547
Aug.	115	123	417	562
Sept.	117	121	397	554
Oct.	126	148	401	539
Nov.	105	135	365	553
Dec.	99	130	343	538

U. S. Bureau of the Census. Data based on reports from commercial and captive forge shops with monthly shipments of 50 tons or more.

the first quarter. Net foreign investment also will drop about $500 million a year between the second and first quarters.

The effect of these factors, sums up Mr. Slichter, "will be a net rise in income-determining expenditures between the first and second quarters at the rate of around $500 million a year."

Unemployment Slows Up

Another encouraging sign is the decrease in the rate of unemployment. When figures are in for February, Mr. Slichter believes they will show unemployment of less than 5 million. The increase of about $500 million will be less than half the increase from December to January. The customary upturn in the spring, while it will be moderate this year, will halt the rising unemployment trend.

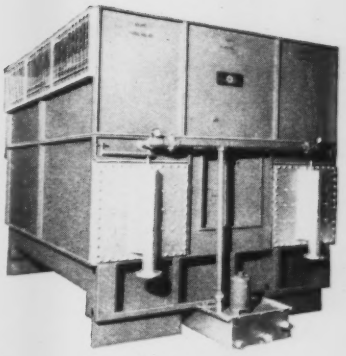
Proposes Three Actions

The government could do three things of immediate value in combating the decline, Mr. Slichter believes: 1. Aggressive easing of credit by the Federal Reserve—the recent relaxation of bank reserve requirements is a step in the right direction, he says. 2. Speed up the filling of government orders for goods that have already been placed, and speed up the placing of orders that are almost ready to be placed. 3. Have the Federal Reserve state it will not revert to its extreme credit policies but will permit the price level to adjust itself to rising costs.

GNP To Hit $439 Billion

James M. Dawson, vice president and economist of the National City Bank of Cleveland, goes one step more by predicting that gross national product will advance to an annual rate of $439 billion in the fourth quarter. He estimates the output of goods and services is now about $427 billion.

Comparing estimates of first and fourth quarter activity at annual rates, he sees: 1. All government spending will increase by $4 billion. 2. Plant and equipment spending will decrease by $5 billion, but this will be canceled out by a $5 billion decrease in inventory liquidation. 3. Residential construction will rise $500 million. 4. Net foreign investment will drop $1 billion. 5. Spending for consumer durable goods, nondurables, and services will jump $3 billion each.



Is your plant CRITICALLY SHORT of WATER?

You will make major water savings, reduce your costs, solve your problems of water supply or disposal and get HIGH OPERATIONAL EFFICIENCY with Niagara "Aero" Evaporative Heat Exchangers, After Coolers or Condensers for these important plant services or processes:

- AFTER COOLING and air drying for large air and gas compressors and AIR LIQUEFACTION
- COOLING ENGINES, COMPRESSORS, HYDRAULIC PRESSES
- COOLING QUENCH BATHS, FURNACES, INERT ATMOSPHERES
- COOLING ROLLS, WELDERS, DRAWING OR EXTRUSION DIES
- PRODUCT AND PROCESS COOLING CHEMICALS OR INTERMEDIATES
- COOLING LIQUIDS OR GASES IN CLOSED SYSTEMS
- VAPOR CONDENSING UNDER VACUUM
- ELECTRONIC PROCESS COOLING

High operational efficiency means: precise temperature for improved product and process quality control, heat removal at rate of input, simple operating conditions, real economy in upkeep, sustained full capacity.

Also it means cooling in a closed system with your product kept free from contamination or, when condensing, getting a pure condensate holding high quality in your product or material.

Niagara machines do the work of a cooling tower plus shell-and-tube coolers with a single machine that saves piping, water handling disposal and treatment expense and 95% of water consumed by contact cooling methods.

Write for Bulletin 129, 130, 132, 136R.

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Over 35 years of Service in Industrial Air Engineering

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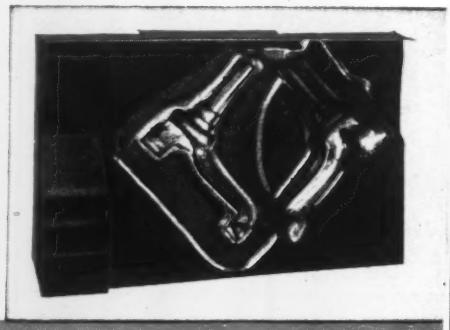
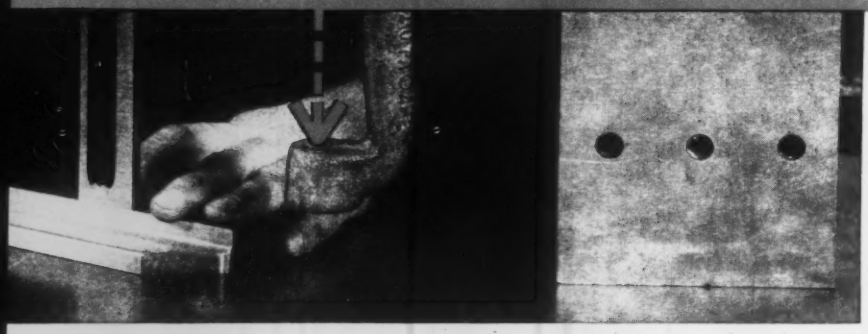
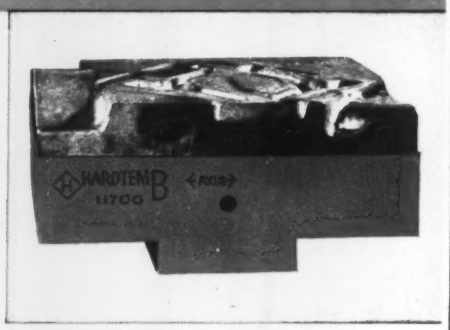


just like the first one . . . it's from Heppenstall Die Blocks





Holding close tolerances in the production of these automobile spindles calls for die blocks that can really stand up under rough duty. This company found the answer in Heppenstall Hardtem Die Blocks . . . and important, too, is the longer than usual production runs they get before resinking.

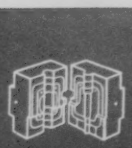
Machinability of Heppenstall Hardtem is another feature well recognized by veteran die sinkers. This long standing Heppenstall reputation has been built by savings in cutting time, longer tool life, and more accurate sinkings.

Forged on all six faces from special Heppenstall Steel, Hardtem and other Heppenstall Die Steels are manufactured in a wide hardness range to match varying customer requirements of service and machinability.

If you have a problem of die block machinability or service life, contact your Heppenstall Representative. He can quickly get the one best answer for you.

These five Heppenstall warehouses carry stocks of the most popular size die blocks:

Bridgeport 5, Conn. • Detroit 32, Mich. • Indianapolis 27, Ind. • Los Angeles 22, Calif. • Pittsburgh 1, Pa.

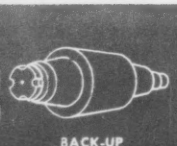

DIE BLOCKS

TONGS

KNIVES

FORGINGS

RINGS


BACK-UP ROLL SLEEVES

HEPPENSTALL

. . . the most dependable name in die blocks

PITTSBURGH 1, PENNSYLVANIA

ERNEST SWAINE
Dixie Tool president

A. V. LORCH
Kaiser Alum. marketing mgr.

RALPH E. HOOVER
Standard Tube exec. v. p.

JAMES M. KNOX
Research-Cottrell exec. v. p.

Ernest Swaine was elected president and general manager, **Dixie Tool Co.**, Bridgeport, Mich. **Milo Shaner** was made vice president and assistant general manager.

A. V. Lorch was named marketing manager, pig and ingot, for **Kaiser Aluminum & Chemical Sales Inc.**, Oakland, Calif. He is succeeded in Chicago as pig and ingot product manager by **W. J. Lawler. D. R. Tietjen** was named assistant product manager, pig and ingot.

Arthur D. Marks was named director of sales, **Hercules Motors Corp.**, Canton, Ohio. He was manager of the foreign division.

Nooter Corp., St. Louis, elected as vice presidents **John Miller** and **William F. Hommert.** They continue in their present duties. Mr. Miller is assistant superintendent; Mr. Hommert, construction sales engineer.

William H. Beegle was made Pennsylvania division manager of **McJunkin Corp.**, Charleston, W. Va., in charge of all operations in Pennsylvania including the recently acquired Chandler-Boyd Co. **John B. Shriver** was made manager of warehouse operations; **Albert J. Conley**, manager of the order department at Chandler-Boyd.

Paul Galton was made sales manager, Plainfield, N. J., division, **Worthington Corp.** Former manager of positioning equipment sales, he replaces **Paul J. Foley**, now general manager-resale for Worthington.

Ralph E. Hoover was elected executive vice president, **Standard Tube Co.**, Detroit. He was assistant to the president.

Byron D. Booth was named general sales manager, **John W. Hobbs Corp.**, Springfield, Ill., a division of Stewart-Warner Corp. Former assistant sales manager, he replaces **F. Lee Farmer**, who remains as vice president-industrial sales.

Joseph P. McGuire was appointed manager, arc-cast molybdenum sales, **Climax Molybdenum Co.**, New York, a division of American Metal Climax Inc. He was Chicago district sales manager.

Richard J. Mills was made general sales manager, **American Hoist & Derrick Co.**, St. Paul. He was eastern regional manager.

Boyd P. Doty Jr. was made Cleveland district sales manager, **United States Steel Corp.** He succeeds James T. **O'Connor**, retired. Mr. Doty was assistant manager of sales in Detroit. He is succeeded by **Lynn D. Patterson.**

Orville J. Hanley was named general manager, **Randolph Peterson Mfg. Co.**, San Diego, Calif.

Jerome H. Frankle Jr., vice president, **Metal Products Co.**, Niles, Ohio, assumes management of the pressed steel division. **Paul D. Werden** was elected secretary and was made manager of the warehouse division. **Raymond C. Varner** was made sales manager, warehouse division.

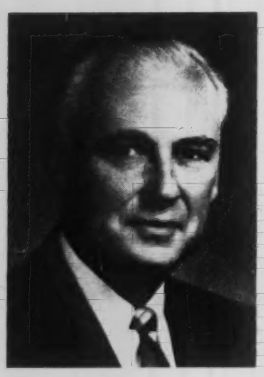
James M. Knox was elected executive vice president and treasurer; **Dr. H. J. White**, secretary of **Research-Cottrell Inc.**, Bound Brook, N. J. Mr. Knox was formerly assistant director and business manager of Brookhaven National Laboratory. Dr. White continues as director of research and development in addition to his duties as secretary.

Paul R. Brucker fills the new post of plant metallurgist at the Midland, Pa., Works of **Crucible Steel Co. of America. Claude M. Sheridan** was named division metallurgist-flat rolled products, succeeding Mr. Brucker. In Crucible's fuel division, **A. V. Faull** was named superintendent of the recently acquired mine at Hugheston, W. Va. He was superintendent of the Crucible Mine at Crucible, Pa. **Frank A. Burns** was named acting superintendent, Crucible Mine.

Federal Pacific Electric Co., Newark, N. J., made these appointments in its Middle Atlantic Region: **C. G. Landeck** becomes distributor products sales manager and is succeeded as product manager, switch and fusible equipment, by **George A. Bury. F. C. Karlson** replaces Mr. Bury as Baltimore district manager.

William L. Stover was appointed assistant chief engineer, **Mesta Machine Co.**, Pittsburgh.

Edward A. Gray was named southwest district manager for **Sundstrand Aviation Div.**, Sundstrand Machine Tool Co. He has headquarters in



GEORGE T. UNDERHILL
Seymour Mfg. v. p.-sales

KERMIT L. JOHANNSEN
gen. supt. at Fairless Wks.

ABRAHAM I. DRANETZ
Gulton Industries v. p.

HOWARD G. STRASSNER
Stromberg-Carlson post

a newly established office in Arlington, Tex.

George T. Underhill was elected to the new post of vice president-sales, **Seymour Mfg. Co.**, Seymour, Conn. He was vice president and sales manager of Victory Mfg. & Gasket Co. Prior to 1956, he was with Chase Brass & Copper Co. for 27 years.

M. H. Detrick Co., Chicago, elected as vice presidents: **Ray R. Over**, manager, open hearth department, Chicago; **C. B. Edgar**, Pittsburgh district sales manager; **Harry E. Lewis**, general manager, insulation division, Chicago.

Waldo Porter was appointed production assistant, smelting division, **Aluminum Co. of America.** He was northwest power manager, Vancouver, Wash., and is replaced by **W. E. Lawton.**

Angus MacDonald was named director of engineering of both **Motorola Inc.'s** Chicago Military Electronics Center, and the firm's communications and industrial electronics division.

Richard C. Wright, chief engineer, **Iron Fireman Mfg. Co.**, Cleveland, was elected vice president. He is responsible for engineering and the research and development program of the heating, power, and cooling equipment division. **Jack Jordan** was made assistant to the president.

N. S. Bassett was made sales manager, **Davies Laboratories Div.**, Minneapolis - Honeywell Regulator Co., at Beltsville, Md. He joined Honeywell in 1947 as a field sales engineer in the Boston office.

Kermit L. Johannsen was appointed general superintendent of the central operations of **Fairless Works**, Morrisville, Pa., United States Steel Corp. Formerly assistant general superintendent, he is succeeded by **William D. Millar**, former division superintendent, coke and coal chemical works and blast furnaces, Fairless Works.

Abraham I. Dranetz was appointed a vice president of **Gulton Industries Inc.**, Metuchen, N. J. He assumes responsibilities of general manager of the newly created Glennite Instrumentation Div., and vice president of the parent firm. He was formerly director of engineering.

P. J. Haeffner, secretary-treasurer, was elected vice president, secretary-treasurer of **Milwaukee Solvay Coke Co.**, Milwaukee. **Albert P. Mueller**, general superintendent, was elected vice president-operations.

R. J. Foresman was appointed vice president-sales, **American-Lincoln Corp.**, Toledo, Ohio.

J. E. Massey was made chief engineer, **Delta Tank Mfg. Co. Inc.**, with headquarters in Baton Rouge, La. **John S. Perry** succeeds Mr. Massey as Houston district sales manager.

Foxboro Co., Foxboro, Mass., appointed **E. R. Huckman** assistant field sales manager, northern and eastern regions.

Clyde N. Simpson was made Detroit district manager, **Union Twist Drill Co.** He was superintendent of the cutter shop.

Howard G. Strassner was made manager of manufacturing; **Malcolm P. Herrick**, manager of quality control in the Telecommunication Div., **Stromberg - Carlson**, Rochester, N. Y., a division of General Dynamics Corp. **Roy W. Jones** succeeds Mr. Strassner as manager of production. **William J. Conley Jr.** becomes manager of plant maintenance.

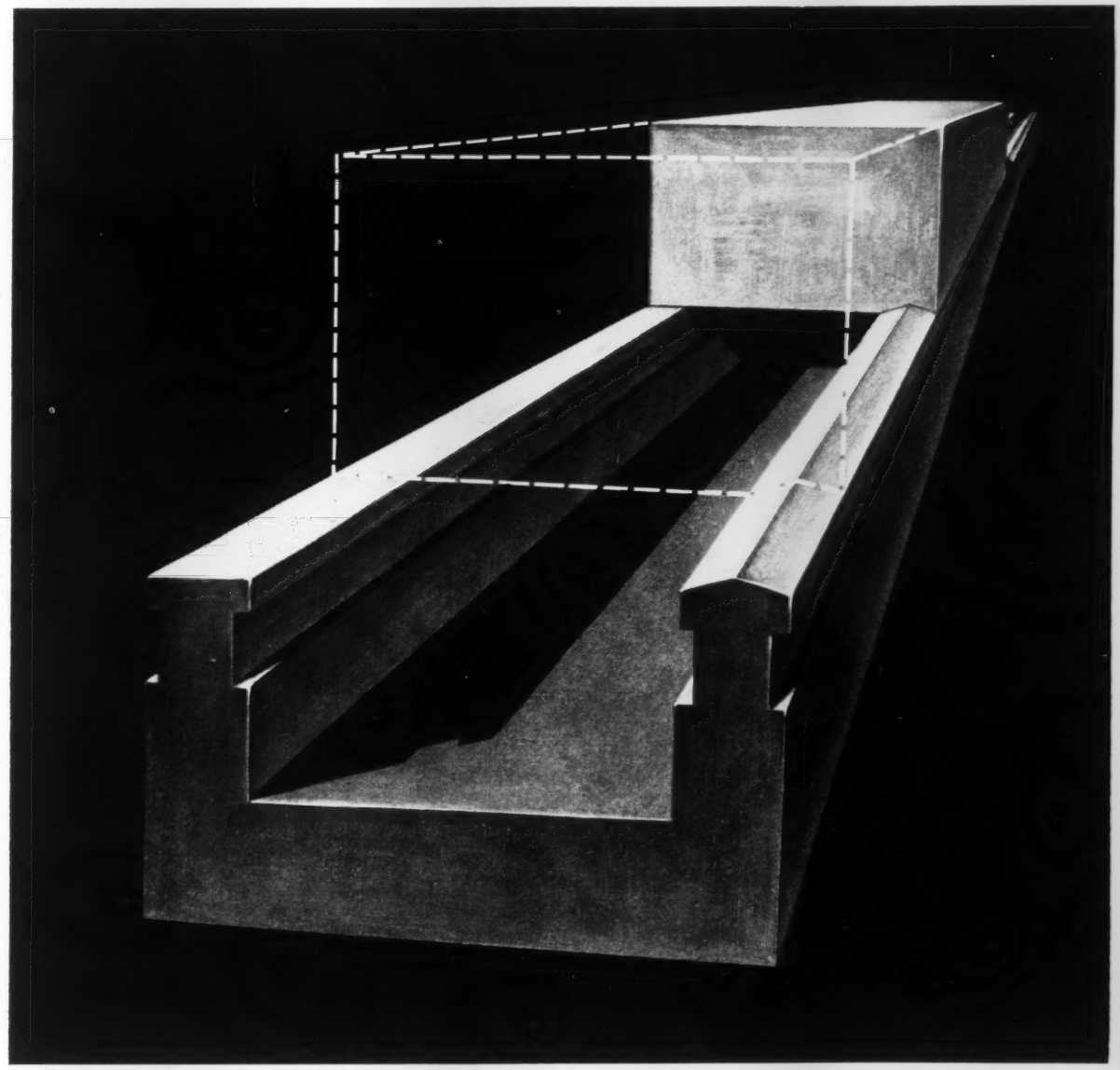
G. M. Taylor was elected vice president-manufacturing, **Koehring Co.**, Milwaukee. He was director of marketing.

At the **Chase Metal Works** plant of Chase Brass & Copper Co., Waterbury, Conn., **Ernest M. Mallock** became technical consultant, handling special projects and programs. He is succeeded as superintendent of the tube mill by **Theodore C. Drabers. Charles Z. Jackson** succeeds Mr. Drabers as superintendent of the casting shop and allied departments.

Armand L. Labbe, who recently retired as metallurgist with American Smelting & Refining Co., joined **Industrial Fabrics Div.**, Albany Felt Co., Albany, N. Y., as industrial consultant on problems concerning smoke and dust control and other phases of dry filtration.

James S. Tomlinson was elected president and general manager, **General Abrasives Co. Inc.**, Niagara Falls, N. Y. Formerly executive vice president, he succeeds **Alan V. Parker**, now chairman.

Hugh Brunner was named to the new post of assembly plant manager at the Cedar Rapids, Iowa, facility of **Square D Co.** He was pro-



for smooth, steady sliding way action

Febis K lubricants – specially formulated to prevent the irregular, stick-slip motion of slow-speed sliding ways in machine tools – are equally effective in higher speed operations. The special composition of Febis K lubricants gives them the unusual property of providing lower *static* friction than *sliding* friction. As a result, moving parts, starting with a low force, will not jump ahead. Febis K lubricants provide smooth, steady sliding action...assure better precision work. Febis K lubricants also help reduce wear because of their strong adhesion to sliding surfaces. And they have mild EP and rust-preventive properties. Febis K lubricants are available in *two* grades: *Febis K-53* – with the right viscosity for small- and medium-size machines; *Febis K-73* – for heavier machines and more heavily loaded machines. Both Febis K lubricants have passed the Cincinnati Milling Machine Company's stick-slip test and have been checked and approved by the Bijur Lubricating Corp. for use in their automatic lubrication systems. For further information contact your nearest Esso Standard Oil Company Division Office: Boston; Pelham, N. Y.; Elizabeth, N. J.; Bala-Cynwyd, Pa.; Baltimore; Richmond; Charlotte; Columbia, S. C.; Memphis; New Orleans.

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PETROLEUM PRODUCTS

CARL VON LINSOWE
chief eng., Case-Ind. works

JOHN CLEM
Air-Maze sales mgr.

GORDON C. CURRY
Dollin gen. sales mgr.

duction manager at the Cedar Rapids unit.

Carl von Linsowe was appointed chief engineer of **J. I. Case Co.'s** crawler tractor works in Churubusco, Ind. He recently joined Case after 17 years with General Motors Corp., where he headed the products engineering department of a subsidiary. Mr. Von Linsowe fills the vacancy at the Churubusco Works created when **T. A. Haller** transferred to Case at Racine, Wis., to direct its newly organized engineering research and development center.

John C. Arntzen and **George W. Schlutius** were elected executive vice presidents of **Mississippi Valley Structural Steel Co.**, Chicago. Mr. Arntzen is succeeded as plant manager, Melrose Park, Ill., by **Richard A. Simonsen. A. O. Muehlenbrock** succeeds Mr. Schlutius as plant manager, St. Louis. **Fred P. Haas** was made contracting manager, Melrose Park. **Marvin R. Boydstun** was made contracting manager, St. Louis.

Roy Prochnow was appointed assistant to the director of operations, **Clearing Machine Corp.**, division of U. S. Industries Inc., Chicago. He was factory manager.

Tecler Aluminum Corp., Seattle, appointed **Elmo G. Guiles** district sales manager for California; **D. C. Hall**, a sales engineer. Mr. Guiles was with Soule Steel Co.

Dr. Karol Pilarczyk was made director of research and development, **De Laval Steam Turbine Co.**, Trenton, N. J.

John Clem was made sales manager, **Air-Maze Corp.**, Cleveland. He was Chicago district manager.

Rankin Garrett was made district sales manager, eastern region, Cameron Split-Die forgings, **Cameron Iron Works Inc.** He is in New York.

R. A. McNeilly was made works manager for **Tube Reducing Corp.**, Wallington, N. J. He was previously manager of fabricating engineering, metals division, Olin Mathieson Chemical Corp.

Al Schwider was made manager, **HPI Structural Div.**, Hastings Plastics Inc., Santa Monica, Calif. He was formerly associated with Dow Chemical Co., and Honeycomb Structures.

Ray V. Clute was made western division sales manager, **Huck Mfg. Co.**, Detroit. He was Philadelphia regional manager.

William P. Williams was named to a newly created post, that of product manager for fuel burning systems and the Power-Pak packaged automatic boiler of **Orr & Sembower Inc.**, Reading, Pa. He was southeastern district manager.

Carpenter Steel Co. appointed **Robert A. Kokat** Philadelphia branch manager; **Gerald R. Garinger**, assistant branch manager, Toledo, Ohio, warehouse.

D. H. Montville was elected vice president-sales, **Shartle Div.**, Middletown, Ohio, Black-Clawson Co., He has been sales manager since 1954.

Gordon C. Curry was appointed general sales manager, **Dollin Corp.**, Irvington, N. J. He was formerly associated with Hoover Co. and Precision Castings Co. Inc.

Peerless Mfg. Div., Dover Corp., elected **Thomas D. Bromley** president to succeed **F. W. Carter**, now chairman. **Robert B. Stone** was made vice president-sales. Mr. Bromley and Mr. Stone retain their positions as president and vice president, respectively, of Dura-Vent Corp., Redwood City, Calif., a subsidiary.

Robert B. Lynch was made plant manager of **Taco Heaters Inc.**, Cranston, R. I.

A. J. Mackan was made Cleveland district sales manager, **Federated Metals Div.**, American Smelting & Refining Co.

James M. Stevenson was made sales manager, vacuum melted products, Metallurgical Products Dept., **General Electric Co.**, Detroit.

OBITUARIES...

Jess L. Gleason, 65, purchasing agent, **Oliver Bros. Inc.**, died in Syracuse, N. Y., Feb. 22.

Herbert W. Halblaub, 62, electrical superintendent, **Wickwire Spencer Steel Div.**, Buffalo, Colorado Fuel & Iron Corp., died Feb. 22.

E. R. Lamhofer, 50, purchasing agent, **Erie Malleable Iron Co.**, Erie, Pa., died Feb. 20.

George F. Pettinos, president, **George F. Pettinos Inc.**, Philadelphia, died Feb. 22.

Thomas Leach, 76, founder and former president of **Leach Steel Corp.**, Rochester, N. Y., died Feb. 19.

W. J. Granville Sr., 66, retired district manager of **Aluminum Co. of America's** Bridgeport, Conn., plant, died Feb. 21.

Ralph C. Filley, 36, production manager, **High Pressure Equipment Co.**, Erie, Pa., died Feb. 19.

Max Sidell, 60, founder and president, **Seattle Iron & Metals Corp.**, Seattle, died Feb. 19.

From Midget to Monster

WILLIAMS WRENCHES *fit the job**

In scale comparative illustration — Actual openings: Midget 3/16", Monster 3 1/8".

ALLOY WRENCHES

A complete selection from 33 patterns, 400 sizes with openings from 3/16" to 3 1/8". Drop-forged from selected alloy steel and heat-treated for maximum service. Quality chrome plated finish.

CARBON WRENCHES

From a tiny 2 1/2" to a giant 52 inches long — there are 29 patterns, 542 sizes with openings from 3/16" to 7 5/8". Correctly designed, they are made from selected carbon steel drop-forged and heat-treated for extra strength. Finish is black enamel.

***Over 95% of your wrench requirements are stock items in THE BROADEST LINE OF ITS KIND.**

WILLIAMS
DROP FORGED
TOOLS OF INDUSTRY

FOR PROMPT, PERSONAL SERVICE

INDUSTRIAL DISTRIBUTORS — SERVING INDUSTRY ECONOMICALLY — THE RIGHT HAND OF PRODUCTION

CALL YOUR LOCAL DISTRIBUTOR

J. H. WILLIAMS & CO.
406 VULCAN STREET
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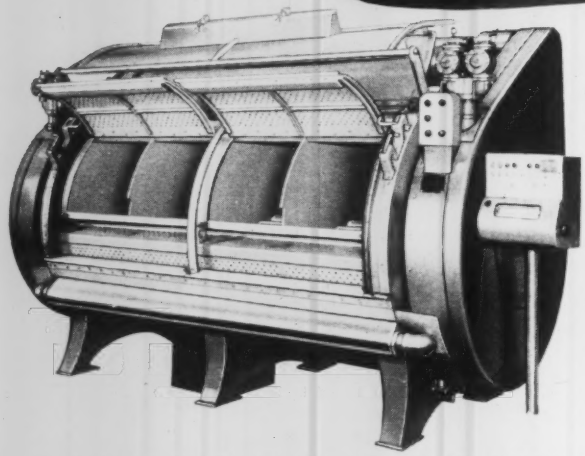
CUTLER-HAMMER

MOTOR CONTROL

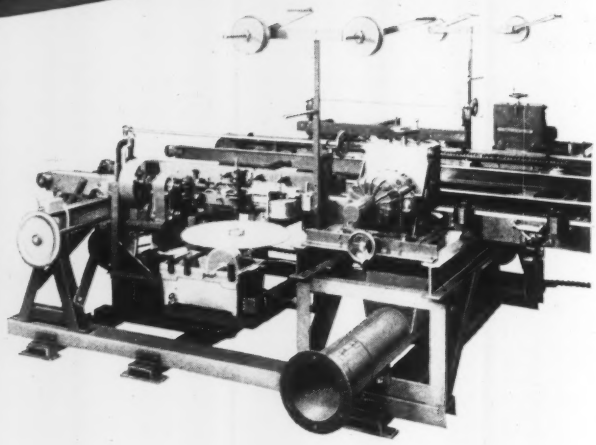
C-H

CHOICE OF THE LEADERS

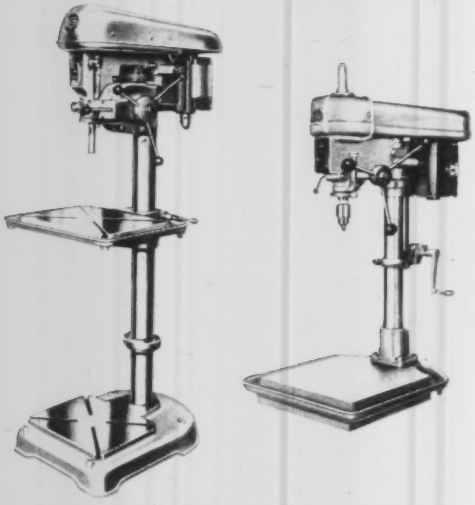
THE MARK OF BETTER MACHINES



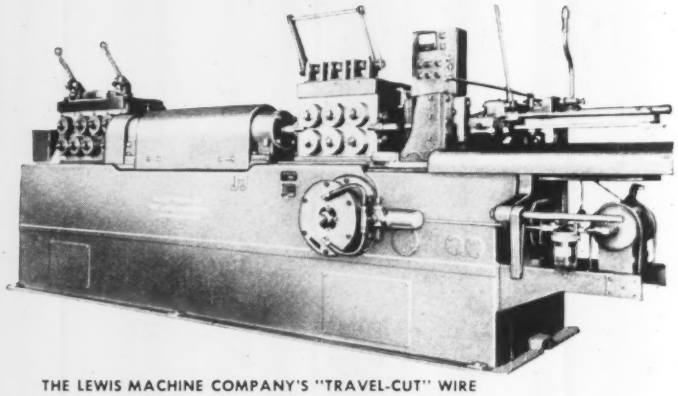
THE 1,500 LB. "MASTER" MANUFACTURED BY THE MILLER LAUNDRY MACHINERY COMPANY; DETROIT, MICHIGAN; INCLUDES CUTLER-HAMMER CONTROL AS STANDARD EQUIPMENT.



THE HIGH SPEED WALLBOARD SAW AND EDGE STRIPPER BUILT BY THE BRACKETT STRIPPING MACHINE CO. IS EQUIPPED WITH CUTLER-HAMMER MOTOR CONTROL.



BOTH THE WALKER-TURNER AND DELTA POWER TOOL DIVISIONS OF THE ROCKWELL MANUFACTURING COMPANY INCLUDE CUTLER-HAMMER CONTROL COMPONENTS AS STANDARD EQUIPMENT ON THEIR MACHINES.



THE LEWIS MACHINE COMPANY'S "TRAVEL-CUT" WIRE STRAIGHTENING AND CUTTING MACHINE USES CUTLER-HAMMER THREE-STAR MOTOR CONTROL AND HEAVY DUTY OIL-TIGHT PUSHBUTTONS.

Preference For The Stars

Among the numerous manufacturers of every type of machine made there are always a certain few who are recognized as leaders. These leaders have won success because of the excellence of their product. Basic to such excellence is sound engineering, and sound engineering invariably means the utmost discrimination in the selection of components for inclusion on their machine. Able engineers respect able engineering. And for this reason Cutler-Hammer Three-Star Motor Control and Control Accessories are so frequently the repeated choice of the leaders, and the mark of better machines. CUTLER-HAMMER Inc., 1211 St. Paul Avenue, Milwaukee 1, Wisconsin. Associate: Canadian Cutler-Hammer Ltd., Toronto.

Millions Flow into Research Programs

Metalworking industry continues to enlarge its facilities to develop new and improved products and processes demanded by its customers. Here's roundup of latest projects

THE PACE of research and development in the metalworking industry is being increased to keep up with demands for more efficient products and processes (see STEEL, July 15, 1957, p. 93).

Enlarged engineering laboratory facilities have been placed in operation by Formsprag Co., Warren, Mich. The firm will step up its program of research and development on all types of sprag clutches. Representing a 100 per cent increase in area, the laboratory provides for basic research and product development, as well as for testing new sprag and clutch designs. S. T. Noall is manager of the laboratory.

Forward Look—"In this age no company can afford to stand still," J. Lawrence Buell Jr., Formsprag president, says. "We are seeking to improve our product in anticipation of industry demands ten years ahead."

Wigton-Abbott Corp., Plainfield, N. J., is erecting a $3.5-million research center for Hooker Electrochemical Co. near Niagara Falls, N. Y. It will contain initially about 69,000 sq ft of laboratory, office, utility, and storage space. It will have facilities for infrared, physical, chemical, analytical, and distillation laboratories.

Federal Telecommunication Laboratories, Nutley, N. J., a division of International Telephone & Telegraph Corp., plans to consolidate its research and development operations in a new structure, having 100,000 sq ft of floor space. It will provide facilities for research in communications, over-the-horizon microwave radio, inertial navigation, radar, radio navigation, electronic business systems, and related fields.

Allis-Chalmers Mfg. Co., Milwaukee, will construct new engineering, development, and research laboratories in Greendale, a suburb of Milwaukee. The initial building will have 23,000 sq ft for laboratories (research, scientific studies, and analyses). Offices and a machine shop will also be in this building. Among the projects to be undertaken will be design, construction, and testing models, mockups and prototypes of nuclear reactors and associated equipment.

Babcock & Wilcox Co., New York, is expanding its critical experiment laboratory at Lynchburg, Va., to include a 10-kw "pool type" test nuclear reactor. The unit will be used primarily to conduct experiments involving nuclear fission at elevated temperatures and to test the products of B&W's nearby nuclear fuel element plant. B&W officials say the experiments should "significantly" influence the design of future reactors.

Milford Rivet & Machine Co., Milford, Conn., has completed its new laboratory and research facilities. New methods and product development, as well as the development and refinement of manufacturing equipment and manufacturing techniques, will be studied. Fred H. Merwin, chairman, will be in charge of the research laboratory.

Stoner-Mudge Co., Pittsburgh, has completed a research and development center which more than doubles its laboratory facilities. The firm, a division of American-Marietta Co., produces protective coatings for the container, paper, appliance, automotive, textile, metalworking, and plastics industries. Stoner-Mudge is now "working on 176 research projects for 77 different end uses," says F. R. Stoner Jr., president.

Hotpoint Building Plant

Hotpoint Co., Chicago, is building a refrigerator compressor plant at Elk Grove, Ill. It's scheduled to be completed in September.

Phoenix Iron Names Agent

International Selling Corp., New York, has been appointed exclusive export agent for the United Kingdom, Europe, North Africa, and Middle East by Phoenix Iron & Steel Co., Phoenixville, Pa., a subsidiary of Barium Steel Corp., New York.

Will Sell Revere Aluminum

Singer Steel Co., Cleveland, has accepted the distributorship of Revere aluminum products for the Ohio district. The firm has incorporated a merchandising subsidiary, Singer Aluminum Co., which will be integrated with the parent organization for the warehousing of Revere metal and for sales, service, and administration.

Allison-Campbell Div.

American Chain & Cable Co. Inc., Bridgeport, Conn., has united its Allison Div. and Campbell Machine Div. under the name of Allison-Campbell Div. The division makes abrasive cutting equipment, abrasive wheels, and abrasive cutoff devices.

Will Build at Nitro

General Chemical Div., Allied Chemical & Dye Corp., New York, is building a hydrofluoric acid plant at Nitro, W. Va. The new facility will supply the metal industry and other industries in the area, as well as atomic energy requirements.

Dana Renames Division

Dana Corp., Toledo, Ohio, changed the name of its Parts Div. to Standard Equipment Div. Neil A. Moore is general manager.

Buys Heating Furnaces

Haynes Stellite Co., a division of Union Carbide Corp., Kokomo, Ind., has purchased four gas-fired furnaces for heating nickel and cobalt-base alloys. The furnaces are being built by Salem-Brosius Inc., Carnegie, Pa., to handle hearth loads up to 20,000 lb.

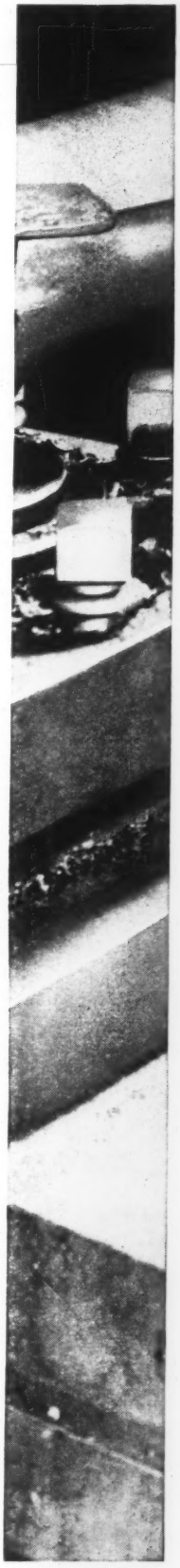
Harvey Extrudes Bus Bars

Aluminum bus conductor is being fabricated by Harvey Aluminum for its primary reduction plant at The Dalles, Oreg. The bus bars, measuring 4.125 in. by 20 in. in lengths up to 43 ft, were extruded at its Torrance, Calif., plant. Over 10

(*Please turn to Page* 110)

Roughing and finishing this large motor shaft, a modified Standard Carboloy Tool (tipped with Grade 350) boosted the number of linear inches cut by 30% over other tools.

SETUP: **Material**—AISI 1045 modified (hot-rolled). **Speed** — 300 SFPM. **Feed** — 0.020 inch. **Depth of cut**—1/16 to ⅛ inch. **Coolant**—Yes.



3 reasons why industry specifies more Carboloy® braze-type tools than any other brand

1 Consistent, record-breaking performance

Tough jobs, like the one at left, are the real test of a tool's performance. And in plant after plant, Standard Carboloy Tools have proved that they deliver maximum production – at lowest cost per piece. They're made by the company that pioneered "standards." Their shanks are of the finest cold-drawn steel. Their carbide edges are automatically diamond-ground for accurate machining.

2 Complete range of styles, sizes, grades

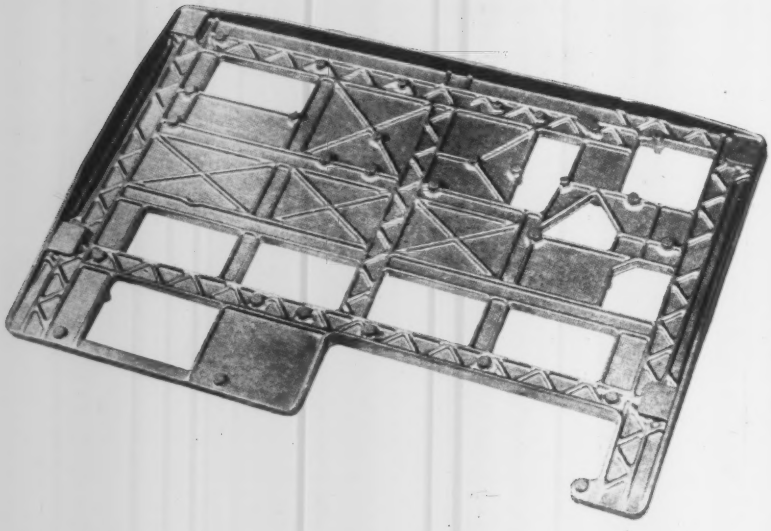
Standard Carboloy Tools are available in thirteen styles, hundreds of sizes. Used "as is" or adapted to specials, they can handle up to 80% of all single-point jobs – from rough turning to precision threading. They're available with tips of Carboloy Extra-Performance steel-cutting grades 330, 350, and 370. Or, with carbides for cast irons, super alloys, nonferrous and nonmetallic materials.

3 Immediate delivery from local stocks

There's no waiting for "long distance" delivery when you order Standard Carboloy Tools. Authorized Distributors of Carboloy cemented carbides in 140 cities keep full stocks on hand for off-the-shelf delivery. Your local Carboloy Distributor is listed in your Yellow Pages. Call him today. Or write: *Metallurgical Products Department of General Electric Company, 11141 E. 8 Mile Road, Detroit 32, Michigan.*

CARBOLOY®
CEMENTED CARBIDES

GENERAL ELECTRIC



EXCELLENT BASE FOR PROFITS

This ninety-six pound casting was made for the National Cash Register Co. of Nodulite®, Hamilton Foundry's ductile iron. The casting forms the base for the new Post-Tronic Accounting Machine. It measures 37½" by 23½" with sections varying from ¼" to 1½". Ductile iron was chosen for this part because of its ductility, dimensional stability, rigidity, and machinability.

Sharp pencil buyers know that the *ultimate* cost of a casting rather than the purchase price is most important to the cost of the end product. Dimensional accuracy, uniform machinability, fine surface finish, low rejects and delivery of orders on schedule result in castings at lowest ultimate cost and insure your reputation for product quality.

When new and unusual design problems arise in the selection of metal and the casting of parts, you will find that the skill and integrity of your foundry is your best insurance that specifications—and delivery schedules—will be met.

GRAY IRON • ALLOYED IRON • MEEHANITE® • DUCTILE (NODULAR) IRON • NI-RESIST • DUCTILE NI-RESIST • NI-HARD

HAMILTON FOUNDRY

The Hamilton Foundry & Machine Co., 1551 Lincoln Ave., Hamilton, Ohio • TW 5-7491

(*Concluded from Page 107*)

million lb of aluminum bus conductor were extruded. Annual capacity of the plant, scheduled to go into operation in a few months, is 108 million lb of primary aluminum.

Forms Hydraulics Div.

Brown & Sharpe Mfg. Co., Providence, R. I., formed a Hydraulics Div. by combining three previously independent business activities: Hydraulic Products Div., Providence; Double A Products Co., Manchester, Mich.; and power unit portion of Rosaen Co., Hazel Park, Mich. The new operation will be headed by Herbert H. Upton, general manager.

Buys Annealing Furnace

National Tube Div., U. S. Steel Corp., will install a gas fired, continuous roller hearth annealing furnace at its Ellwood City, Pa., plant. The furnace was designed by Salem-Brosius Inc., Pittsburgh, for normalizing and cycle annealing alloy steel pipe.

Will Run Ilmenite Property

E. I. du Pont de Nemours & Co., Wilmington, Del., is operating the Trail Ridge and Highland ilmenite mining properties. Du Pont uses ilmenite in the manufacture of titanium dioxide pigment and as the raw material for titanium metal. Humphreys Gold Corp. had operated the Trail Ridge mine since 1948.

Forms Western Division

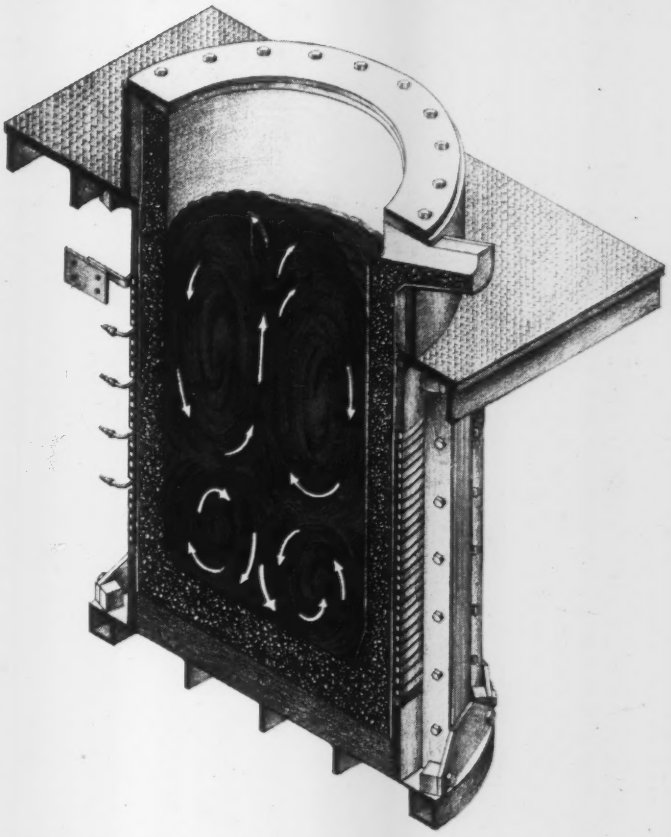
A. O. Smith Corp., Milwaukee, established an Aeronautical-Western Div. at Anaheim, Calif. Arnold H. Prosser is manager of the division. The plant makes parts and equipment for the armed services.

Bell Unites Activities

All Buffalo and Niagara Frontier defense product activities of Bell Aircraft Corp. are being operated by a newly established autonomous operating unit, Niagara Frontier Div. R. P. Whitman is general manager of the division, as well as first vice president of the corpora-

AJAX-JUNKER

a new principle in 60 Cycle induction melting



WHAT IT IS:

- A cylindrical induction coil supplied with ordinary 60 cycle current induces heat and vigorous electromagnetic stirring in the molten metal charge.

  Integrated electric controls regulate power, maintain high power factor automatically.

  Monolithic refractory linings are made by ramming against the sturdy water-cooled coil held in a rigid frame of magnetic and structural steel.

  This new principle was perfected in Europe over the last seven years. Over 100 Junker furnaces are now in use. AJAX-JUNKER designs are based on latest experience, using American components and practices throughout.

WHAT IT CAN DO:

- Outstanding results are proven in these fields:

  DUCTILE and ALLOY IRON CASTINGS
  RECOVERY OF IRON TURNINGS
  RECOVERY OF ALUMINUM SCRAP

  Available sizes range from 1 to 10 tons, with normal melting cycles from 2 to 4 hours. Power ratings are 200 kw through 1500 kw.

May We Explore the Possibilities of this New Method with You?

AJAX USA

60 CYCLE INDUCTION MELTING

ENGINEERING CORPORATION

TRENTON 7, NEW JERSEY

Associated Companies: Ajax Electrothermic Corporation Ajax Electric Company

NEW! from Erie Foundry Co.

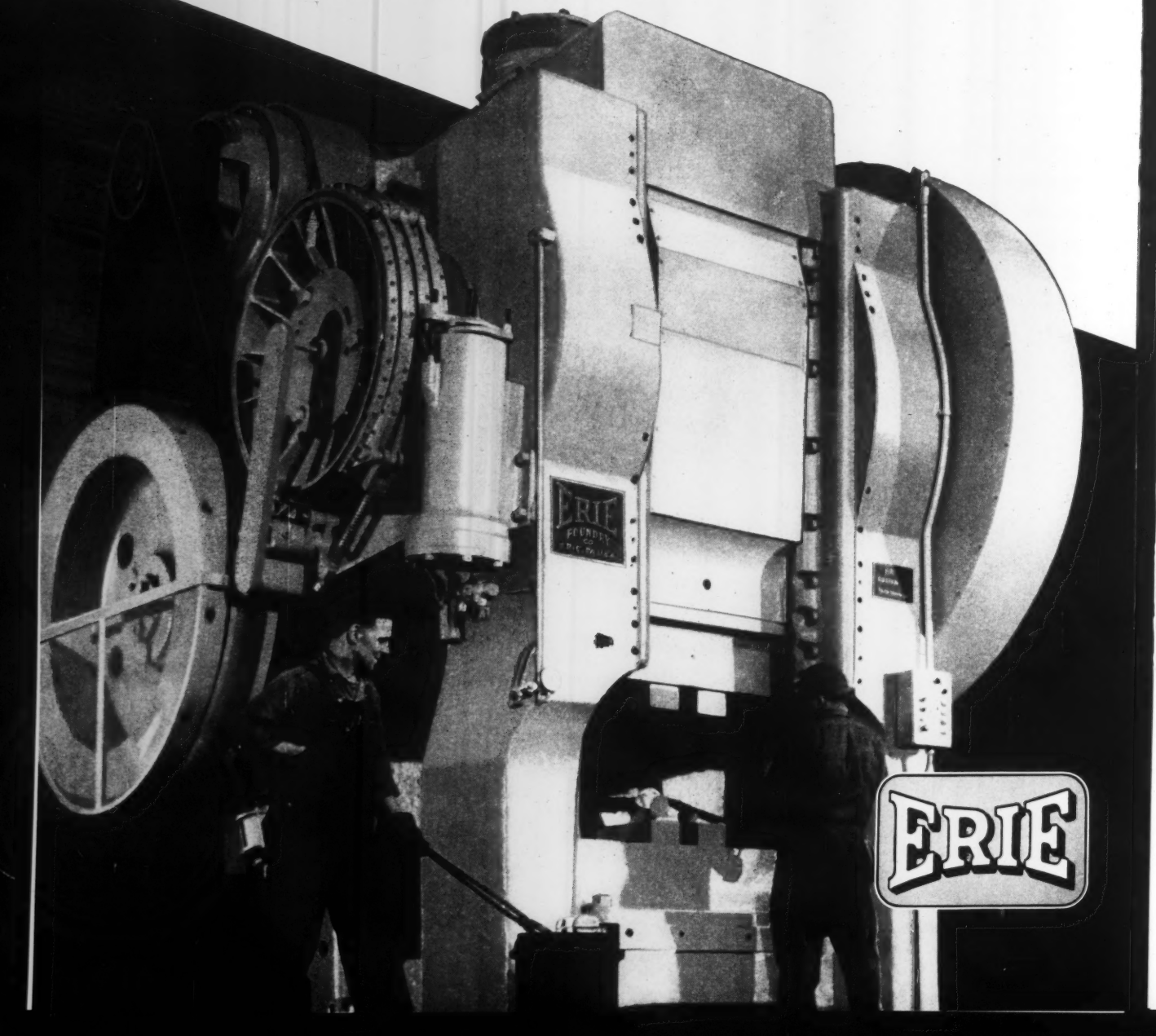
Mechanical Forging Press

By eliminating the conventional pitman, Erie's new mechanical forging press is rugged, more rigid, and more compact. Guiding is unusual, too.

You are invited to see this press in operation at the Erie Foundry plant. Please call or write Mr. Claude L. Boring, General Manager, for an appointment.

Greatest name in forging machinery—Since 1895

ERIE FOUNDRY CO.
ERIE 2, PA.



tion. Roy J. Sandstrom, vice president, has been named to plan and direct all Bell projects and activities in the satellite and space travel categories.

CONSOLIDATIONS

Negotiations for a merger of **Consolidated Electrodynamics Corp.**, Pasadena, Calif., and **Cenco Instruments Corp.**, Chicago (see STEEL, Feb. 3, p. 58), have been broken off.

Union Asbestos & Rubber Co., Chicago, acquired **Sturdi-Bilt Engineering Co.**, that city, maker of steel storage racks.

Midwestern Instruments Inc., Tulsa, Okla., purchased **Modern Art Metal Finishing Co.**, Chicago. Midwestern will move the property to a recently completed building at its Tulsa plant.

Cummins Engine Co. Inc., Columbus, Ind., purchased **Atlas Crankshaft Inc.**, Fostoria, Ohio.

Universal Marion Corp., Washington, has proposed acquisition of **Scullin Steel Co.**, St. Louis. Universal makes excavating equipment and distributes steel pipe, industrial supplies, and plumbing fixtures and supplies. Scullin produces parts for railroad-freight cars.

Ainsworth-Precision Castings Co., Detroit, has been created as a division of Harsco Corp. through merger of these companies: **Ainsworth Mfg. Co.** (stamping, forming, and assembly); **Precision Castings Co.** (diecasting, machining, and finishing); and **Globe Imperial Corp.** (plastics). Forbes Howard is general sales manager of the new division.

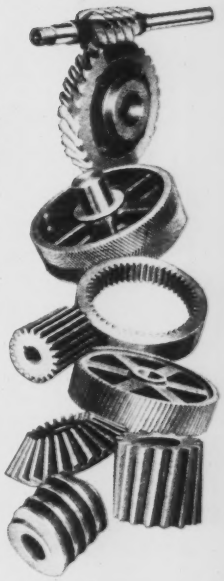
Boyles Galvanizing Co. of Colorado, purchased **Jarrett Plating Co.** Both are in Denver. Electric plating facilities will be installed. Herbert S. Jack Jr. is manager.

Santa Fe Western Corp., Albuquerque, N. Mex., acquired controlling interest in **Titanium Fabricators Inc.**, Burbank, Calif. Officers

(*Please turn to Page* 116)

Gears with long useful lives . . .
the result of *high quality at H&S**

***Quality materials**
***Modern tooling**
***Superior workmanship**



Highly appreciated by the paper mill industry, for instance, are the large spur gears such as the one shown here. This gear has 140 teeth of 2 diametral pitch and 8″ face. It is being completed on a 100″ Fellows Gear Shaper that generates high quality external and internal spur gears up to 8″ face and 1½ D.P.

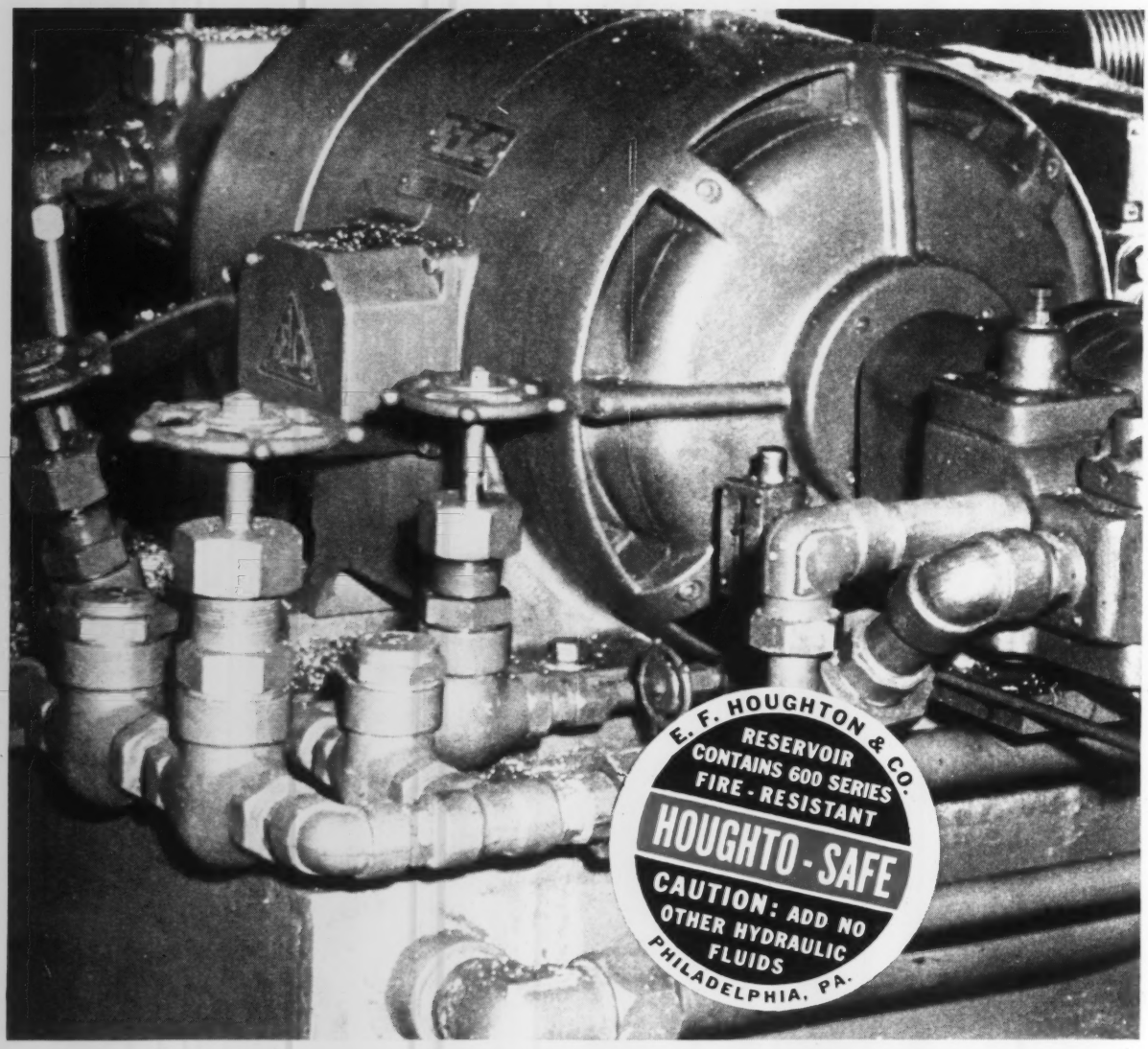
The modern Horsburgh & Scott plant is equipped with many new precision tools to meet today's demand for higher quality industrial gearing. You can judge our ability to serve you by these examples of size range:

Spur gears up to 156″ diameter
Helical gears up to 100″ diameter
Sykes Herringbone gears up to 60″ diameter
Bevel gears up to 77″ diameter
Worm gears up to 60″ diameter

You benefit by the exacting care that we exercise in every manufacturing step. Tell us your requirements; quotations will be sent by return mail.

A request on your company letterhead will bring a copy of the new H&S Gear Catalog 57 to help you design and order industrial gears.

THE HORSBURGH & SCOTT CO.
GEARS AND SPEED REDUCERS
5112 Hamilton Avenue
Cleveland 14, Ohio



End fire danger . . . and hidden hydraulic

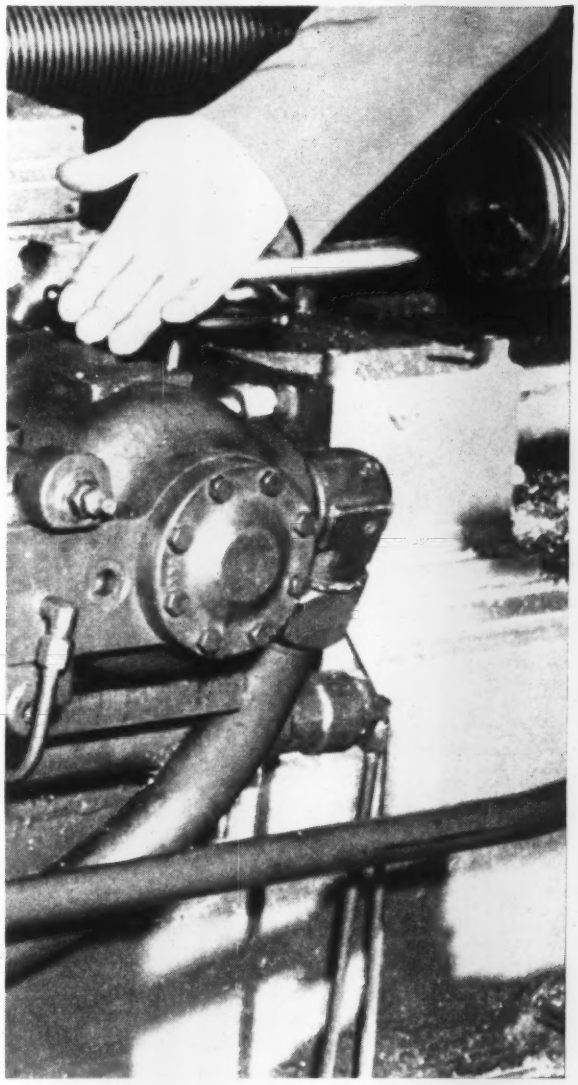
There's no need to pay more than a minimum cost for safety from hydraulic fire danger. And there's no need for costly complications in making a changover to fire-resistant fluids. It's a simple matter of considering lubricating needs, packing compatibility, and overall efficiency . . . then choosing a fluid that answers your requirements. And this is just exactly what Houghton can do for you, because Houghton is the only maker and supplier of all the three separate types of fire-resistant hydraulic fluids needed in covering today's broad range of hydraulic requirements.

You can find out the *real* minimum cost of safety from hydraulic fires *only* by considering *all* factors . . . not only the fluid but its effect on pumps, packings, paint, hoses . . . every part of the hydraulic system it touches. That's just exactly what Houghton does before recommending a fire-resistant fluid for *any* system.

Complete and Unbiased Service

You get this *complete* and unbiased kind of service from Houghton because Houghton supplies all three types of hydraulic fluids used for safety purposes in industry today. The same Houghton engineers and scientists who developed and tested these fluids are ready to apply their know-how to any hydraulic problem you may have. Their knowledge includes not only fluids, but packings, paint, and even pipe compounds desirable for industrial hydraulic equipment.

Their satisfied customers include industry's foremost firms. The U. S. Navy has used Houghto-Safe 600 series fluids for more than four years in the hydraulic catapults that fire fully loaded aircraft



costs, too

from carrier decks. Another Houghto-Safe, the 1000 Series, conforms to the Navy's standard for hydraulic deck-edge elevators.

It's The Same Story With Oils

You can get the benefits of this same Houghton technical service, too, where fire-resistant fluids are not needed. Houghton Hydro-Drive oils cover the full range of hydraulic oil applications. And Houghton also furnishes a superior rust-preventing and lubricating oil additive for systems that use water . . . Hydrolubric.

Check the descriptions of Houghto-Safe fluids at the right. Look over the list of Hydro-Drive fluids, too, if you now use oil-base fluids. Get the latest product bulletin on fluids answering your needs by writing to E. F. Houghton & Co., 303 W. Lehigh Ave., Philadelphia 33, Pa.

Houghton Hydraulic Fluids for all industrial applications

HOUGHTO-SAFE FIRE-RESISTANT FLUIDS

PHOSPHATE-ESTER FLUIDS—HOUGHTO-SAFE 1000 SERIES

These fluids are available in three viscosities to meet the needs of systems consistently running at temperatures of 150°F. and above, and where maximum lubricity is needed.

WATER-GLYCOL FLUIDS—HOUGHTO-SAFE 600 SERIES

These fluids will adequately meet the requirements of up to 85% of all hydraulic systems. Houghto-Safe 600 Series provides maximum fire protection with good lubricity for systems operating in the lower temperature range.

WATER-OIL EMULSION FLUIDS—HYDROLUBRIC F. R.

These are lower cost fire-resistant fluids. They are stable, afford good lubricity and provide adequate fire protection where hazards are intermittent or remote.

WHERE NO FIRE HAZARD EXISTS... HYDRO-DRIVE

These fortified, high quality oils provide high film strength, maximum protection of moving parts, oxidation stability, gum solvency and protection against rust.

FOR WATER-OPERATED HYDRAULIC SYSTEMS... HYDROLUBRIC

An additive that comes close to turning water into oil. Used 1 to 1000, it lubricates valves, packings. Won't gum up or form scum. Non-corrosive. Won't pit steel, stain copper or brass.

A HOUGHTON Packing for Every Hydraulic Need

HOMOGENEOUS RUBBER

"O" rings, "V", and U-cup packings, diaphragms and molded rubber parts.

FABRICATED RUBBER

Of asbestos cloth or duck, frictioned with synthetic rubber. Available in "V", "U", cup, flange and diaphragms.

VIM LEATHER

Also in "V", "U", cup and flange shapes, plus synthetic rubber-impregnated type, which combines advantages of leather and rubber.

HOUGHTO-SAFE

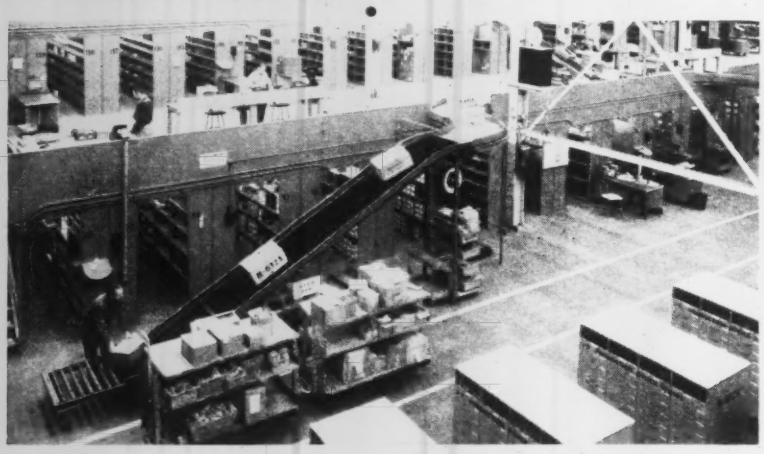
. . . a product of

E. F. HOUGHTON & CO.

PHILADELPHIA · CHICAGO · DETROIT · SAN FRANCISCO

Ask Standard

how to cut costs with conveyors



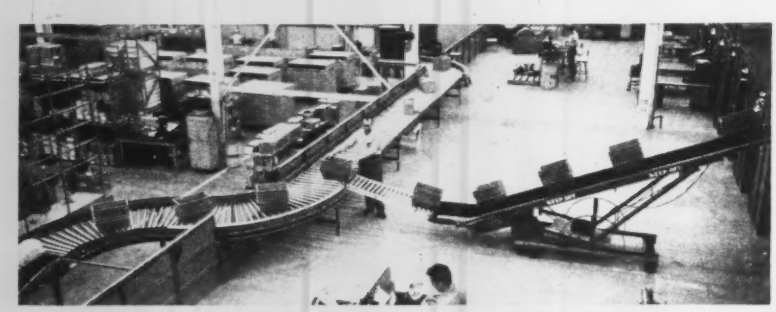
One of two Inclinebelt conveyors that carry parts to reversible live roller conveyor at second level. Belt conveyors are reversible to bring down outgoing parts. Note minimum space used for conveyors.

Multi-level conveyors help Douglas Aircraft CUT STORAGE AREA BY 2/3

When it's difficult to spread out — look up! That's what the El Segundo Division of Douglas Aircraft did when confronted with the need to triple the capacity of a parts stockroom facility.

Today, instead of stocking parts on one level, they're using three. Movement of parts in and out of all three levels is quick, simple and efficient. They're doing it with Standard conveyors.

This relatively simple solution to what could have been a difficult problem is one example of how Standard Conveyors pay-off in every industry. STANDARD CONVEYOR COMPANY, North St. Paul 9, Minnesota. Sales and Service in Principal Cities.



Third level is reached via portable Handibelt conveyor from reversible live roller conveyor. Patented easy-adjustment features of Handibelt permit quick reversing of flow.

For details on Standard Conveyors, help in selecting the right type and size to meet your needs, contact the Standard representative listed in your classified phone book or write direct. Ask for Bulletin Y-3.

(*Concluded from Page 113*)

of Titanium Fabricators are: President, O. M. Bell; secretary, H. O. Van Petten; vice presidents, Fred Spiegl and P. T. Wilson.

NEW OFFICES

Stainless Steel Div., Jones & Laughlin Steel Corp., opened a district sales office at 2795 Wilshire Blvd., Los Angeles, Calif. John E. Cottler Jr. is in charge of the operation.

Aluminum Co. of America, Pittsburgh, established a resident sales office at 325 Grove St., Boise, Idaho. Robert W. Roylance is the Boise representative.

Vacuum Equipment Div., F. J. Stokes Corp., Philadelphia, opened a sales office at 77 Bedford St., Stamford, Conn. J. C. Coleman is office manager. The Stokes office at Mt. Vernon, N. Y., has been closed.

NEW PLANTS

Rockwell Mfg. Co., Pittsburgh, is operating its new 106,000 sq ft plant at Porterville, Calif. This facility produces and repairs gas meters and other Rockwell products for the west coast market. W. M. Connor is assistant vice president and acting general manager of the plant.

Corning Glass Works, Corning, N. Y., will build a plant at Bradford, Pa., to make electronic components.

J. M. Tull Metal & Supply Co. Inc., Atlanta, opened its $400,000 warehouse at 1301 25th Ave. N., Birmingham, Ala. The 50,000 sq ft structure stocks metals, metal accessories, and industrial specialties. Homer Hamer is manager of the Birmingham operation.

Bound Brook Oil-Less Bearing Co., Bound Brook, N. J., will build a powder metallurgy fabricating plant at Sturgis, Mich. The million dollar plant will be geared to high

A few typical Gar high-precision products. At left in the center is a stainless steel mandrel on which copper is deposited to form the microwave step transformer (center). Cutaway section of transformer is held at right. Parts with more complex shapes are formed on expendable mandrels. Machined components, such as flanges and iris plates, can be fitted to mandrels and "grown" in place, eliminating need for brazing or soldering which would distort tolerances.

Periodic-reverse plating with "Plus-4" Anodes helps GAR mass-produce extreme-precision parts

The parts above are electroformed components for radar and microwave communication systems. Their complex inside surfaces must be exceptionally accurate in form and dimension. GAR Precision Parts, Inc., Stamford, Conn., has developed the art of electroforming such close-tolerance products into a practical mass-production process by the use of periodic-reverse acid-copper electroplating with "Plus-4"® Anodes — Anaconda's phosphorized copper anodes.

Periodic-reverse plating (5 seconds of plating and 1 second of deplating is a common cycle) has a leveling effect on the deposit, helps produce more uniform wall thickness – particularly important in irregular shapes and thickness up to .125".

"Plus-4" Anodes make the following contributions to the process:

1. Better anode corrosion—15% to 20% more usable copper.
2. Denser, smoother deposits with finer grain. Gar states this gives finished plate 10% greater tensile strength, makes finish-machining easier.
3. Rate of deposition is 8% to 10% faster for a constant amount of current.
4. More uniform build-up, without treeing. Heavier deposits can be made without intermediate grinding. Gar estimates 12% to 15% savings in copper.
5. Less sludge—no "bagging"—means easier tank maintenance, less down-time for cleaning.

See for yourself how "Plus-4" Anodes can simplify acid-copper electroplating and electroforming, reduce your costs. Write for information on how you can get a test quantity to supply one tank. Address: The American Brass Company, Waterbury 20, Conn. In Canada: Anaconda American Brass Ltd., New Toronto, Ont.

57144B

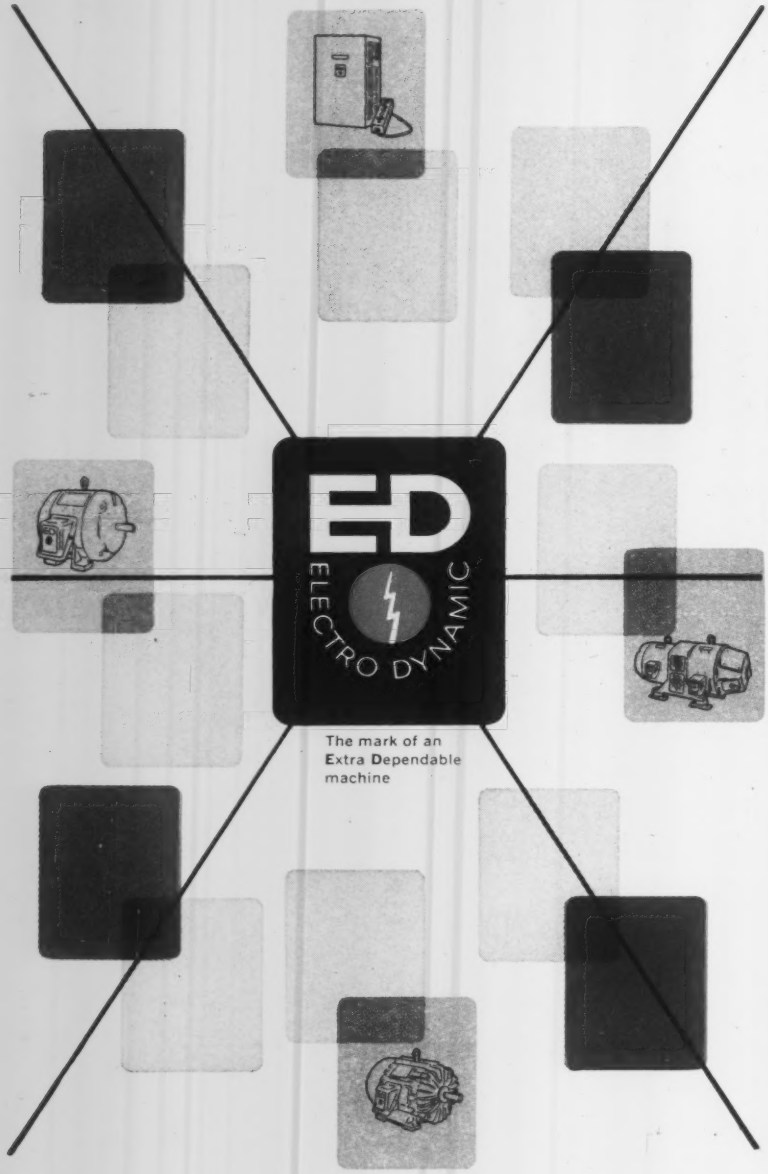
ANACONDA®

"PLUS-4"

Phosphorized Copper Anodes

made by THE AMERICAN BRASS COMPANY

FOR USE UNDER PATENT NO. 2,689,216



What this symbol means

Like the brand name on other quality products you buy, the E.D. symbol on your electric motors means "The Best".

You know also that there is an E.D. expert nearby whenever you need him. Electro Dynamic's broad network of offices includes a chain of over 25 warehouses set up across the country to provide utmost speed of delivery to you.

Complete line of a.c. and d.c. motors from 1 to 300 h.p., Geared Motors, Selectrol and Selectron Variable Speed Drives and Motor Generator sets.

Telephone or write for Bulletin 50-A.

ELECTRO DYNAMIC
DIVISION OF GENERAL DYNAMICS
CORPORATION
BAYONNE, NEW JERSEY

volume production of sintered bearings and parts. The firm is also modernizing and expanding its home plant and large research facilities in New Jersey.

A. Milne & Co. Inc., distributor of tool and die steels, has established a warehouse at 2230 E. River Rd., Dayton 39, Ohio.

Hopper Machine Works Inc., Bakersfield, Calif., opened a steel jobbing and industrial supply house at 261 H St., Fresno, Calif. H. E. Nestell is plant manager; Alfred Leslie, sales director. V. D. Hopper is general manager of the company, including the manufacturing plants in Bakersfield and Taft, Calif. The company makes heavy industrial and agricultural equipment, sheet metal products, and various metal defense items.

Stackpole Carbon Co., St. Marys, Pa., will build a plant at De Soto Avenue and Lassen Street, Chatsworth, Calif. Initial manufacturing will be in the field of small electronic parts.

Cadillac Gage Co., Detroit, has completed construction of a branch plant at 1866 Whittier Ave., Costa Mesa, Calif. Production will include missile and aircraft components. Howard Carson is manager.

NEW ADDRESSES

Babcock & Wilcox Co., New York, moved the Charlotte, N. C., district sales office of its Boiler Div. to 129 Trade St. S. T. Mackenzie is vice president in charge of sales for this division.

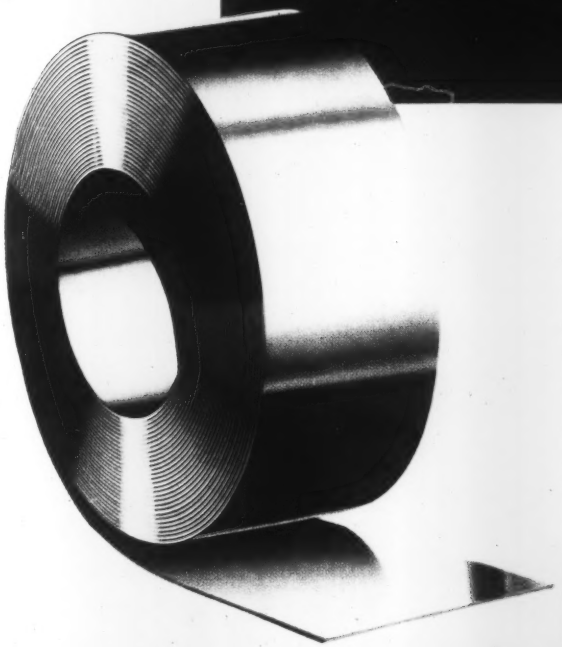
Punch Div., Pivot Punch & Die Corp., North Tonawanda, N. Y., moved to larger quarters at the firm's Special Tooling Div., 1254 Erie Ave., that city.

Sun Chemical Corp. moved to 750 Third Ave., New York 17, N. Y.

F. J. Stokes Co. of Canada Ltd., subsidiary of F. J. Stokes Corp., Philadelphia, moved its Toronto headquarters to 4198 Dundas St. W. Fred Y. Walters is manager of the Canadian company.

we do **one** thing—

and we do it very well!



STRIP STEEL production is our specialty. From this you gain special benefits: experienced counsel on your strip applications...dimensional exactness...uniform quality, to speed product fabrication...the finish you want, in every coil. For superior quality and superior service in stainless, spring, alloy or clad metal strip steels *call Superior!*

Superior Steel

DIVISION OF

COPPERWELD STEEL COMPANY

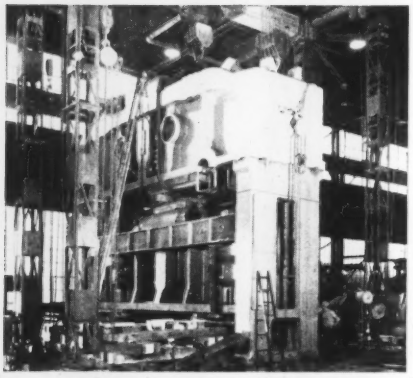
CARNEGIE, PENNSYLVANIA

For Export: Copperweld Steel International Company, New York

(Advertisement)

THERE'S A BETTER WAY . . .

"Task Force Tactics" Save Money on Tough Machinery Installations



TWO 100-TON "A" FRAMES. (CCC built) were needed to position the crown of this big Hamilton press.

YES, there's a way to make and save money when having machinery installed. First, be sure the job is handled by a professional installer. Then make certain that your professional working partner is fast, accurate and responsible.

When stubborn problems develop on a big industrial installation, only a miracle can get the project back on schedule. Commercial Contracting Corporation, a leading U. S. installer based at Detroit, has an effective solution. A task force of specialists is assigned to cover each phase of an installation. Each unit is a self-sufficient team capable of completing the job without additional help. A twin-engine airplane whisks key operating personnel from job to job. Mobile telephones link home office and project activities.

A Commercial Contracting Corporation spokesman says "The task force approach is the only positive method we have of tying together the hundreds of details in the installation of complicated machinery. Delays boost the price of the equipment. By maintaining or beating schedules, we make money for our customers."

This technique was born of necessity to keep pace with postwar industrial expansion. Yesterday's makeshift methods could not meet the challenge. Task force tactics do, and industrial installations have become a big and specialized business.

CCC's reputation, gained through the installation of seven of the 10 major automotive press plants built since 1947, now reaches into the steel, aluminum and other basic metals industries. The company, trained in serving the auto industry, applies its task force techniques to major installations of automation machinery, rolling mills, foundries, press plants and other types of manufacturing equipment.

That's why leading users agree that installing industrial machinery and equipment is not a do-it-yourself project. There's a better, faster and more economical way.

CCC's 16-page illustrated brochure, "Industrial Installations," explains these services more fully. To obtain a copy or help on your own problems, address your request to Commercial Contracting Corporation, 12160 Cloverdale, Dept. 1-S Detroit 4, Michigan.

A TYPICAL CCC "TASK FORCE" UNIT headed by J. C. McLure, *Project Coordinator*. On his left E. C. Sawyer, *Estimating Engineer*, U. A. Strang, *Director-Purchasing* and C. M. Wasson, *Company Pilot*. On Mr. McLure's right C. J. Duke, *Superintendent-Operations*. Q. C. Clark, *General Superintendent* and his *Assistant Superintendents* L. A. Watson and F. Cangemi.

Technical Outlook

LOW COST STEEL— Diamond Alkali Co. continues to experiment with its desulfurizing reactor for pig iron, with the goal of developing it into a steelmaking furnace. Avenue of approach: A slag that desulfurizes and desiliconizes equally well, which can be used with a minimum of oxygen (relying on turbulent action) to bring down the carbon to the mild steel level. The potential: A furnace with a capacity of 60 tons an hour for less than $500,000.

DESTRUCTION-PROOF BOX— Consolidated Electrodynamics Corp., Pasadena, Calif., wanted to protect oscillograph records from the effects of jet plane crackups. The answer: A box that withstands 400 times the force of gravity and 2000° F. Literally explosionproof, it has a stainless shell over a foamed silicone resin which covers a ductile iron box. For added protection, a fire-resistant paint foams at 300° F, forming a thick insulating layer.

SURFACE MEASUREMENT— A new British microscope makes it possible to assess surface relief to 1 microinch at a glance. The scope makes use of interference fringes to bring out a degree of surface roughness. It can be used directly on flat or curved surfaces, and on internal surfaces by making plastic film replicas.

X-RAY GAGE FOIL THICKNESS — Kaiser Aluminum & Chemical Co. controls the rolling of aluminum foil from 0.00025 to 0.00651 in. thick by monitoring it with x-rays. Since rolling speed directly affects foil thickness, the gage sends corrective signals to the rolling mill controls. General Electric Co. developed the x-ray device.

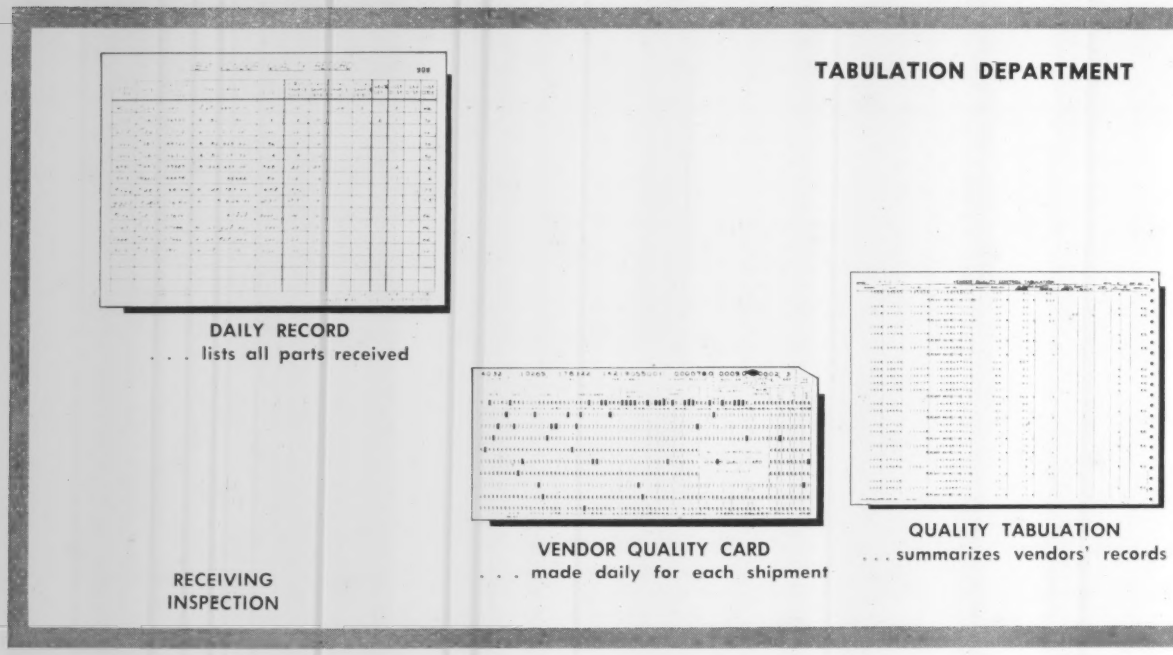
TUBE SHEET— Alcoa is adapting Revere Copper & Brass Inc.'s Tube-in-Strip process to aluminum. Aluminum sheets with integrally formed tubing will be marketed under the name of Expandable Tube-Sheet. The sheet is rolled from an ingot in which graphite rods have been cast to give the tube pattern. Inflation in a confining die gives the final tube contour. Tube sheets are well established for heat exchangers, but structural uses where the tubes act as integral stiffeners are a wide open field.

STANDBY POWER POTENTIAL— You may soon be using a device called a fuel cell to supplement your regular electrical power, say experts at Pennsylvania State University, University Park, Pa. The cells convert common fuels directly into cheap electricity. They can even use the waste hydrogen from atomic energy plants. Efficiency is double that of steam generators. National Carbon Co., New York, is working on one version and expects it to be ready for market soon.

DISPOSING OF RADIOACTIVE WASTES— A custardlike gel that retains wastes like cesium 137 and strontium may be the answer. Current practice (burial in steel tanks) is costly. The plan of General Electric scientists at the Hanford (Wash.) Atomic Plant is to mix sodium silicate with aluminum, a component of atomic-plant waste, causing the compound to solidify to a milky gel, ready for easy, fast, cheap burial.

CONCRETE BOND— Ever have trouble getting new concrete to stick to the old? You can get some help from an epoxy resin, says Furane Plastics Inc., Los Angeles. It's mixed with a hardener on the spot and brushed onto the old concrete (be sure it's clean). Fresh concrete is poured while film is still tacky.

CARBIDE SEALS PROMISING— Higher temperatures and speeds in gas turbines have exceeded the useful limits of materials such as elastomers and carbon for rotating shaft seals, states an Air Force research report. Experiments indicate that metal carbides might do the job. Other materials tested resisted oxidation and thermal shock but were deficient in wearability.



Punch Cards Aid Quality Control

Tabulating receiving inspection data helps purchaser, engineer, and vendor. Here's the system one firm uses to cut rejects, pare costs, and up finished quality

YOU can get more mileage from a statistical quality control program if you tie it in with a punched card tabulating system.

That's what Allis-Chalmers Mfg. Co., Milwaukee, learned when one of its plants started such a program in its receiving inspection department. Here are some of the benefits it enjoys:

1. Rejections of vendor shipments dropped from 65 per cent to under 6 per cent.

2. Fewer inspectors handle more work. (Samples become smaller as quality becomes consistent.)

3. Production costs are down because work begins with better quality materials.

4. Vendors are happier because quality levels are defined.

How It Works—The Allis-Chalmers system starts with a standard industrial quality control program. Sampling tables are based on the Military Standard 105A. Receiving inspectors write a report when a shipment is rejected or accepted conditionally.

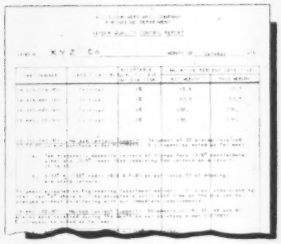
Accounting Function—Tabulating begins with the inspector's reports. The tabulating section gets them regularly and enters the data on a keypunch card.

Each month accounting summarizes the inspection results. They're called "vendor quality control tabulations," and they record the quality of all items received during the month and for the current year.

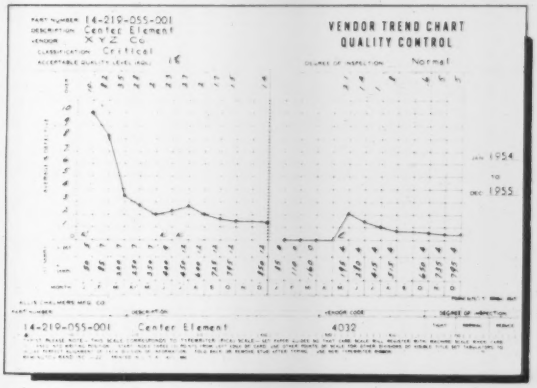
Analysis — Summary cards are made from vendor quality control tabulations. New cards replace the old each month.

Quality control analyzes the summary cards, noting items rejected or accepted by waiver. The current month's record is compared with the AQL specified and the reworks, sortings, and lab rejections noted. The trend is compared with the vendor trend chart to check improvement or deterioration.

The chart also shows percentage of defectives, total samples inspected, and total defectives for a two-year period. Such data determine whether



QUALITY REPORT
. . . points up performance



TREND CHART
. . . is made from data for each vendor, each part

quality control will tighten or loosen sampling requirements.

Control Action—The summary card becomes the foundation for talks with buyer and vendor. Allis-Chalmers lists rejects on vendor quality control reports. Only those who have had shipments rejected or whose quality level has fallen off receive such reports. Items accepted by waiver get special attention. So do repaired items with descriptions of salvage action and costs.

Copies keep engineering abreast of developments. It reviews designs when trouble occurs too frequently. Future designs are frequently altered to correct troublesome points.

Summing Up — Adding the punched card extends the usefulness of statistical quality control by putting inspection results regularly in the hands of those who need them the most—buyers, vendors, engineers, and managers.

With this system, Allis-Chalmers says the supplier knows where he stands—his problems and inspection standards are spelled out more accurately. There are better buyer-vendor relations. A-C is getting a higher percentage of acceptable material, does a minimum of inspection for the supplier, and has fewer shutdowns caused by poor quality materials.

How Much Does It Cost?

"Whether you can use punched cards depends more on how many parts are used than on plant size. Even a plant with 300 employees might easily justify such a system if it uses a lot of different parts.

"If you already have punch card equipment, it certainly is wise to use it for a receiving system. In such a case, cost would be feasible and well worth the valuable information you collect.

"A better yardstick is volume of purchased material and how much you lose by using defective parts. Don't base your decision on installation cost alone: Consider what you'll gain through reduced losses." — **Arnold Jaekel, quality control consultant,** *Milwaukee, senior member, American Society for Quality Control.*

Here are some Allis-Chalmers cost estimates to help you decide. Bases: 1000 employees, 587 different parts.

IBM time and stationery	**$63.00**
Clerical time 36 hr at $3 (incl. burden) . . .	**108.00**
Total cost per month	**$171.00**

(Add $138.00 for each permanently wired IBM board.)

You can also keep such records manually, says Allis-Chalmers. But you can save by using IBM service bureaus.

OLD METHOD

20 operations, plus three rack-unrack stages

From Polishing To . . .

Rack
1. HAND SCRUB
2. WATER RINSE
3. NICKEL STRIKE
4. WATER RINSE
5. ACID COPPER PLATE
6. WATER RINSE
7. DRY
   Unrack
8. BUFF
   Rack
9. HAND SCRUB
10. WATER RINSE
11. GRAY NICKEL
12. WATER RINSE
13. DRY
    Unrack
14. BUFF
    Rack
15. CLEAN
16. CHROME PLATE
17. WATER RINSE
18. DRY
    Unrack
19. PAINT SPRAY
20. HAND STEEL WOOL

NEW METHOD

15 operations (12 for steel parts), plus 2 rack-unracks

From Polishing To . . .

Rack
1. SOAK
2. SPRAY
3. ELECTROCLEANING
4. ACID WATER CYANIDE DIPS
5. COPPER STRIKE*

*Steel parts go from step No. 5 to No. 10 direct. Cast iron have No. 6-9 added.

Unrack
6. BUFF
   Rack
7. COPPER STRIKE
8. SOAK
9. SPRAY
10. WATER RINSE
11. BRIGHT NICKEL
12. WATER RINSE
13. CHROME PLATE
14. WATER RINSE
15. DRY

SAVED

43,000 manhours a year in the plating department and the two departments mentioned at bottom of opposite page.

COST CRISIS . . . How To Beat It

Plating Re-Layout Trims Manhour Waste

Quality is boosted, rejects cut as much as 50 per cent. Production jumps by 40 per cent, making it unnecessary to let subcontract work—the average bill was $4500 monthly

CHALLENGED by continually rising costs of labor, materials, and overhead, how do you hold your ground in a price competitive business?

Management at Emil J. Paidar Co., Chicago, asked that question a couple of years ago. The decision: Wage war on over-all unit production costs.

What has happened in Paidar's plating department is a good example of the success of the campaign.

Before 1955—Prior to plating, all parts were hand scrubbed and pumice-stone washed. They were given a nickel strike, followed by acid copper plate.

The parts were unracked, dried, and returned to a buffing operation for hand coloring. After coloring came another hand scrubbing and gray nickel plating.

Finally, after unracking, the parts were dried, color buffed, then returned to the plating department for chrome plating.

All parts were reracked and cleaned. Recesses that the chrome didn't reach were paint sprayed in a portable booth. After drying, each part was hand rubbed with steel wool to get rid of excess paint.

Now—Purchase of new plating equipment and re-layout of the line brought the savings. The parts are now racked and cleaned in a vertical agitation soak, go through an 18-nozzle spray rinse, and are cleaned electrolytically. Water-acid, water-cyanide, copper strikes, and Rochelle plating follow.

Cast iron parts leave the line here—they go to the buffing room for hand coloring and recleaning.

Steel parts go straight from the copper strike to the bright nickel bath. After rinsing, they go directly into chrome plating tanks.

Buffed cast iron parts get a second copper strike, then go through bright nickel and chrome plating.

In addition to holding the cost line, the improved layout has boosted the plating capacity. An average of $4500 a month used to be spent in subcontracting plating. That expense has been eliminated. Paidar now has the capacity to plate all its own parts.

John Dlouhy, plant manager, says that management was sold the cost-cutting ideas when it became apparent that the lower costs were necessary to stay competitive. "The alternative," says Mr. Dlouhy, "was to see our markets deteriorate with subsequent loss of profits and a loss of jobs to our employees."

This philosophy has led Paidar management into an over-all program to increase the efficiency of production operations. The revision of methods (discarding obsolete equipment and purchasing modern machines that help hold the cost line) is part of the story. In addition, Mr. Dlouhy feels the installation of an incentive system has played an important part. It has raised worker productivity, and at the same time it has boosted worker earnings.

COST CRISIS COMPETITION

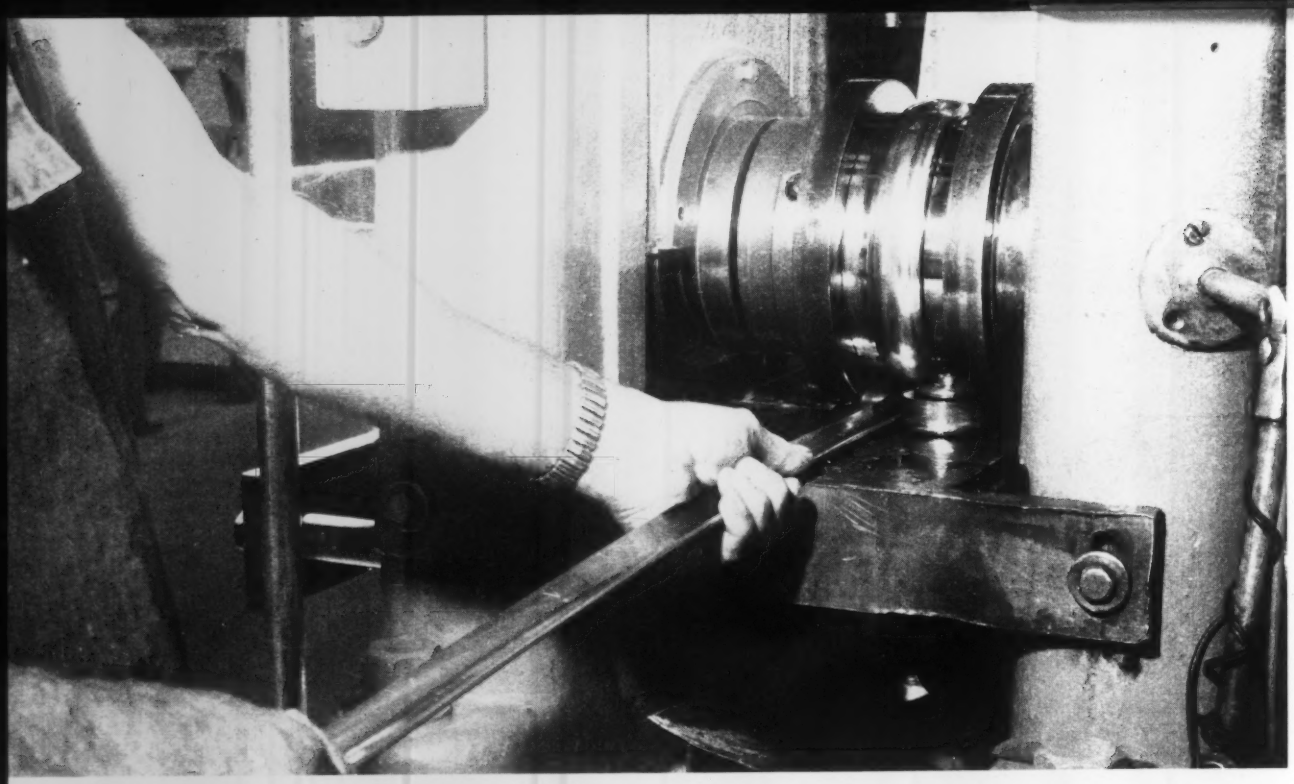
This article is part of a campaign to help industry achieve lower unit production costs. The accompanying example and others to follow are samples of what the editors of STEEL are looking for in their nationwide search for companies that have brought about important cost savings through more efficient use of capital equipment. Does your company qualify? If so, enter the Cost Crisis Competition. Write to the Cost Crisis Editor, STEEL, Penton Bldg., Cleveland 13, Ohio, for your awards kit.

Two More for Paidar

Paidar management didn't stop with the improvement in plating. The same cost-cutting attack was made in other departments. Here are other examples:

1. Two new Warner & Swasey turret lathes displaced eight older ones. Output was boosted enough to bring all subcontract work back into the plant. Even with the increased machine load, the department cut costs about $20,000 a year.

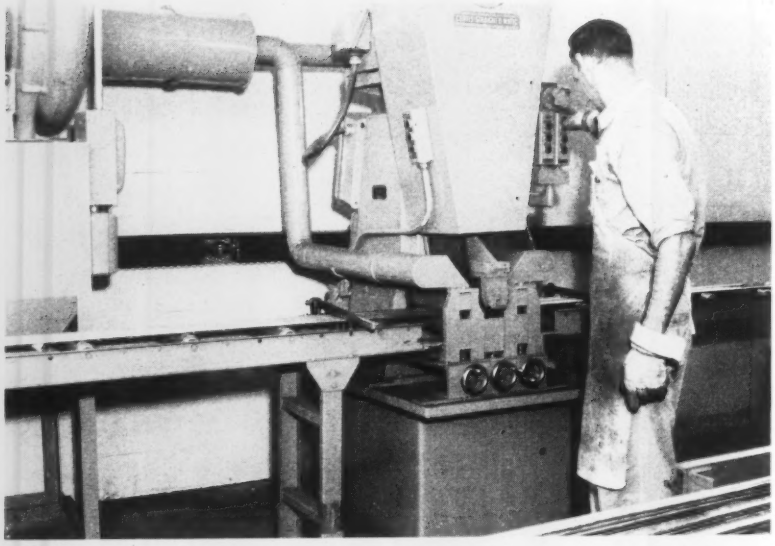
2. Costs in the polishing department have been sliced by about 55 per cent. Worker earnings have jumped about 25 per cent. The answer: Abrasive belt polishing machines have replaced setup wheels. Mr. Dlouhy says the belts are cheaper, have a more uniform cutting surface, and provide better machine utilization than the wheels did.



This strip will be cut into compressor vanes for a jet engine. It takes skill and experience to determine how many passes are needed to make the right cross section

Rolling Reduces Waste

Contour rolling usually leaves some excess stock on the thin edges. Fixture guides strip in toughest metals



Makepeace Company skin grinds its stock to remove pits, seams, slivers, and other imperfections. Belt sander is accurate, fast, and can take deep cuts

Here are some of the shapes contour rolled at Makepeace. Most of them become blades in jet engine compressor rotors

Contour method takes up shape preparation where extrusions leave off. Here's how one firm gave the old process a new twist and cut its machining costs on parts for jet engines

HERE'S a way to cut waste in shaping operations: Contour rolling is hard to beat when it comes to supertough metals, and it shows great potential for everyday parts with complex shapes.

- It eliminates 95 per cent of the machining required to make accurate pieces out of extrusions, solid stock, or hot-rolled shapes.
- It holds cross-sectional tolerances to 0.001 in., yet keeps surface finishes to 8 microinches rms.
- It impresses intricate angles and complex radiuses into rods, wires, tubes, and sheets.
- It cold works any formable material including Inconel X or Hastelloy.

Rolling Technique—Contour rolling has been used to make shapes for jewelry and optical devices for some time. The method: Strips are progressively shaped in several passes through a single stand of roll dies.

D. E. Makepeace Co., a unit of Englehard Industries, Attleboro, Mass., is one firm which has adapted the process to today's needs. It contour forms exceptionally accurate airfoil-shaped vanes and blades for jet engines.

Process—The object, say Makepeace's engineers, is to control the flow of metal from a basic square, flat, or round to a complex contour. The firm has made shapes up to 2 in. thick on one side, tapering to 0.010 in. at the other. They have all sorts of complex angles, radiuses, and curves in between.

Before forming, each strip is carefully tested and skin ground to remove pits, seams, slivers, and similar imperfections.

The strips are passed through shaped rolls several times until they have the desired cross section. Intermediate annealings, lubricants, and careful roll polishing aid proper deformation.

After rolling, overfill or excess stock is removed on a belt sander. Dressed edges get a polishing with Tampico brushes. Each piece is dressed to final size with a disc sander and an abrasive wheel. Surface blemishes and handling scratches are removed by final surface finishing. Parts are straightened during inspection.

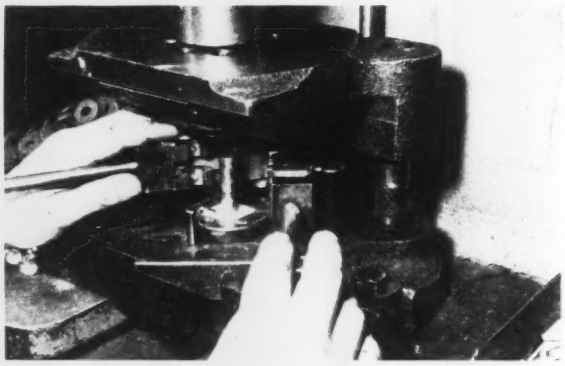
Potential—Contour rolling takes up stock preparation where extrusion leaves off. Steelmen originally turned to continuous hot rolling to eliminate chip wastes for partmakers. Hot extrusions furthered that idea by improving tolerances and cutting production costs for smaller quantities.

Contour rolling goes the extrusion one better. It's economical for small quantities. Accuracy is good enough to eliminate most machining. And to further improve costs, there's no reason why you can't start with an extrusion or a hot-rolled shape.

Here's a small sample of the potential:

Makepeace is using contour rolling to develop a new airfoil for engine rotors that may cut blade costs 80 to 90 per cent. Savings per engine could be as much as $4000.

This bending operation used to be done manually. Putting it on the press boosted output, cut the time 36 per cent



Two fiber spoolheads, two insulators, and a brass cap are assembled on a soft steel core for magnetic coils

Cross shaped blanks are formed into leakproof cans in one operation. The tooling seals the corners

Press Flexibility Boosts Output

This manufacturer of telephone equipment uses standard presses, all small, for a wide variety of jobs. Here are examples of how the equipment is tooled to pay off

MACHINE versatility can be the key to earning a profit, particularly when the product itself can't be standardized. Here are three cases in point from Automatic Electric (Canada) Ltd., Brockville, Ont.

Case No. 1—In the ironwork section, brackets used to be bent manually on a horizontal index bender. It took 140 minutes to turn out a lot of 1000 parts.

By putting this job on a 4-ton hydraulic press, engineers sliced production time to 90 minutes a thousand—a reduction of 36 per cent.

Automatic's Ray Varela points out two more savings: Rejects and labor costs were reduced.

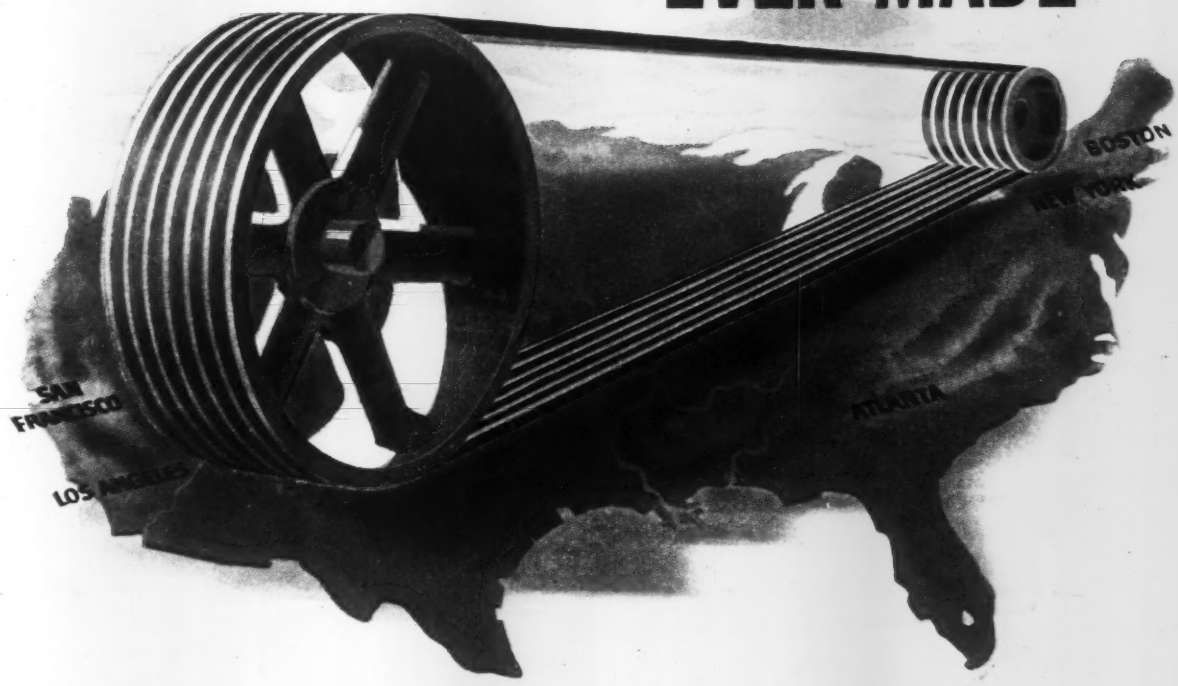
Case No. 2—Spools for magnetic coils have to be assembled and staked. The assembly consists of a soft steel core, two fiber spoolheads, two solid insulators, and a brass cap.

The most critical part of the operation, Mr. Varela says, is to hold the space between the spoolheads to within ± 0.005 in. A slow squeeze on the press does the job.

Case No. 3—Cross shaped blanks are loaded in a die nest. A rectangular punch comes down to force the blank into the die cavity. When the part emerges, it is a leakproof condenser can. The corner sealing is done in the press die.

US RUBBER V-BELTS

MOST DARING TEST OF ITS KIND EVER MADE



Proves unequaled "match-ability" of U.S. Rubber V-Belts

We wanted to see what climate and what age might do to U.S. Rubber V-Belts. Would they still match?

Sticking our chin out, we picked at random—right from stock (and without measurement)—a size C-144 U. S. Rubber V-Belt from each of six different cities across the country. Each belt was shipped in a sealed carton which was not opened until the six were put on a single drive.

Result: *All six belts matched.*

And to prove this was no accident, we performed the same test with hundreds of U. S. Rubber V-Belts. Again, the matching was flawless.

You may never have to put your V-Belts to such an extreme test of "match-ability", but it is good to know that U. S. Rubber's method of building belts—up to 15 feet—and other engineering advances, assure you of a perfect match, *anywhere, any time.*

Contact any "U. S." power transmission distributor, or write us at Rockefeller Center, N. Y. 20, N. Y.

US RUBBER

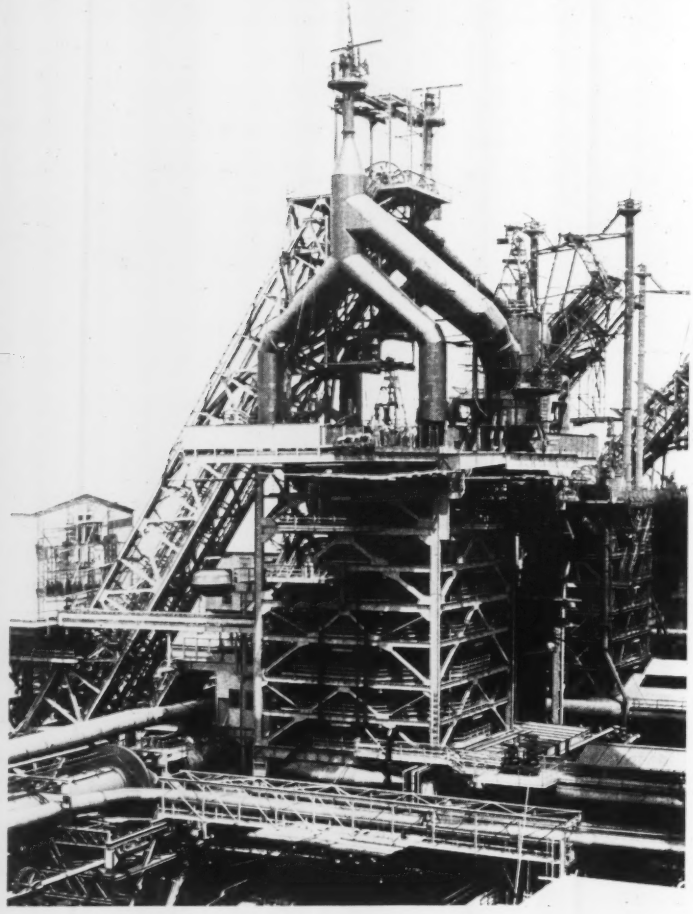
Mechanical Goods Division

United States Rubber

See things you never saw before. Visit U. S. Rubber's new Exhibit Hall, Rockefeller Center, N. Y.

Steelmaking: German-American Style

Rebuilt completely since the war, August Thyssen-Hutte of Duisburg, Germany, is a mill geared to the needs of modern Europe. Emphasis is on light, flat rolled products



Newest blast furnace, No. 7, began making iron last summer. It has a rated daily capacity of 1200 tons of pig iron. It is due to be surpassed next year by a 1500-ton-a-day furnace

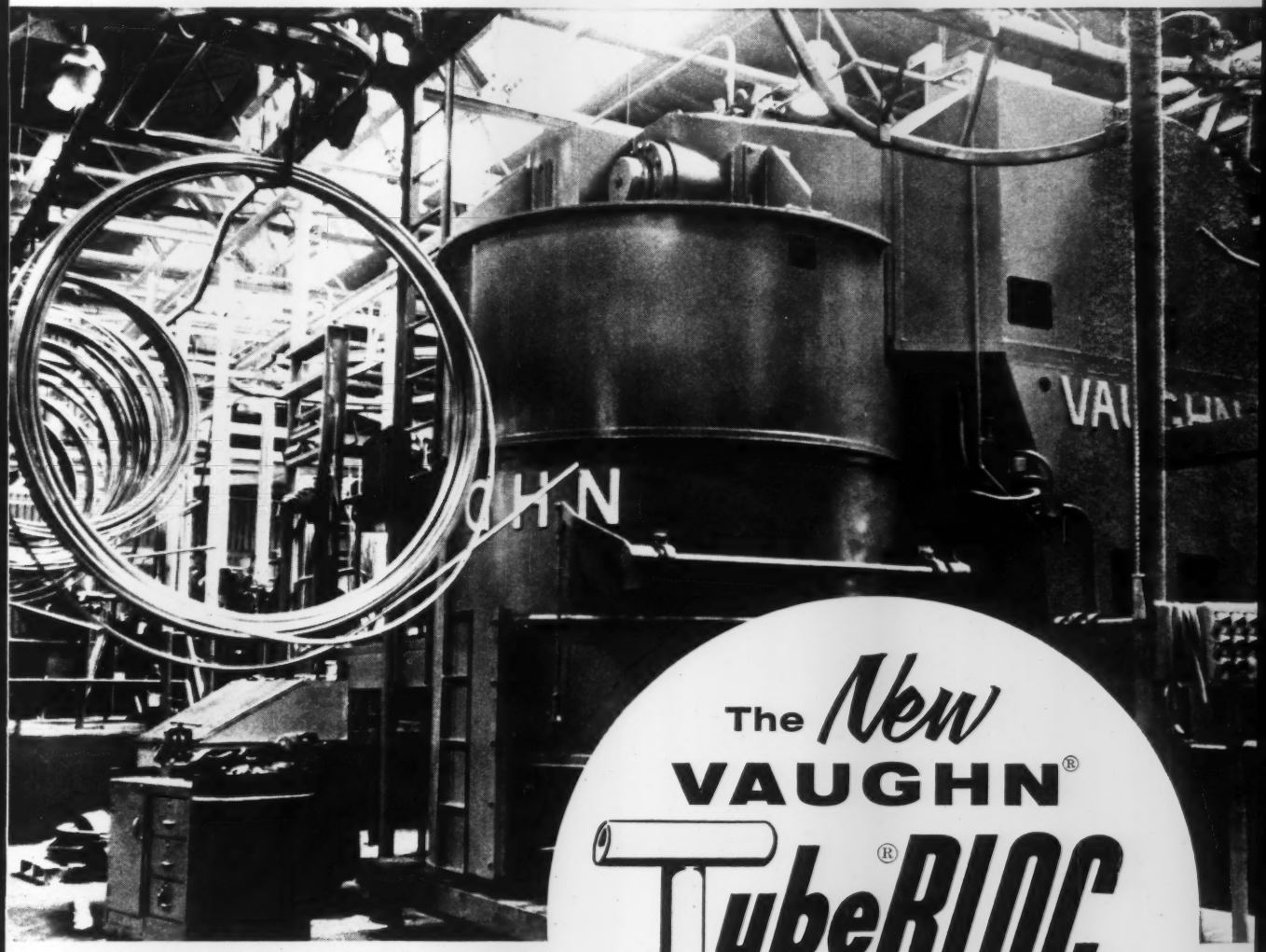
Open hearth charging is American style. The floor charging machine proved faster than the typical European system employing a floor-long scrap bin and a turning crane. The shop has two typically American furnaces. Two others are of German design

NEXT YEAR, August Thyssen-Hutte will light up a blast furnace with a 29 ft 5 in. hearth, the biggest in Germany and big in any country. It symbolizes the direction in which ATH is moving.

Before World War II, August Thyssen-Hutte was one of the giants of German steel, with its headquarters plant at Duisburg-Hamborn in the Ruhr. Wartime bombing, postwar scavenging, and deconcentration laws reduced it to a shell. Today, the company is again a great power. Production of the Duisburg plant tops 1.5 million tons a year of crude steel. With its dozen subsidiaries, including Niederrheinische Hutte (bar and wire products) and Deutsche Edelstahlwerke AG (stainless steel), the combine has a capacity approach-

FOR EXTRA LONG LENGTH TUBING IN COILS

AT SPEEDS UP TO 2,000 f.p.m.



The *New* VAUGHN® TubeBLOC® MACHINE

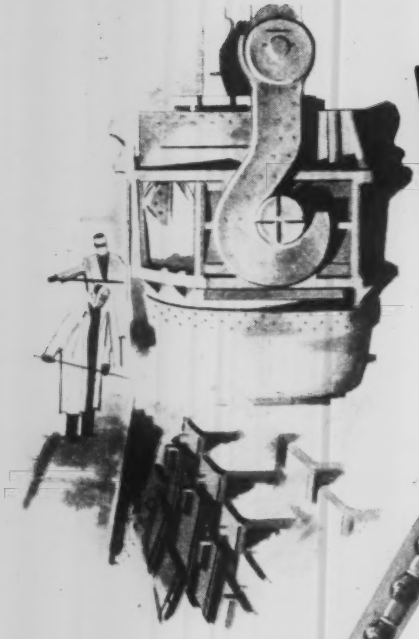
Finishing 1¼" to ¼" copper tubing

TUBEBLOC—the last word in long-length, thin wall tubing production—is another Vaughn achievement. Shown is the Tubebloc installation for Wolverine Tube Division of Calumet & Hecla, Inc., Detroit, where copper tubing is being produced at speeds up to 2,000 fpm in a finished size range from 1¼" to ¼". The tubing coils are conveyor-handled in a modern set-up matching the efficiency of this great Vaughn machine. Let us give you the newsworthy details!

THE VAUGHN MACHINERY CO.
CUYAHOGA FALLS, OHIO, U. S. A.

COMPLETE COLD DRAWING EQUIPMENT—Continuous or Single Hole . . . for the Largest Bars and Tubes . . . for the Smallest Wire . . . Ferrous, Non-Ferrous Materials or their Alloys

"Quick on the Draw!" V®

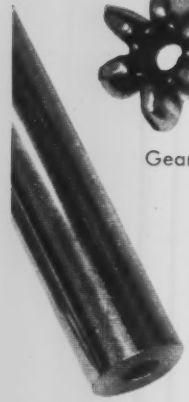


APEX

DEOXIDIZING with APEX ALUMINUM ROD UPGRADES STEEL

Notch bars
1, 2½ and 5 lb.

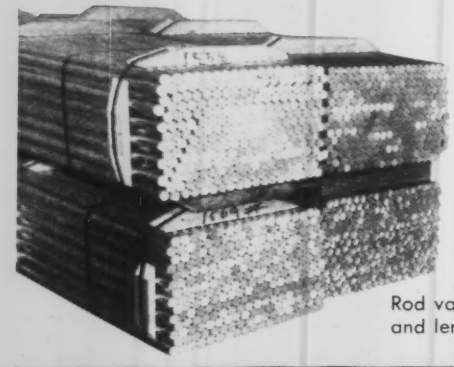
Gear shape



Cored cone

Piglets

Shot



Rod various sizes
and lengths

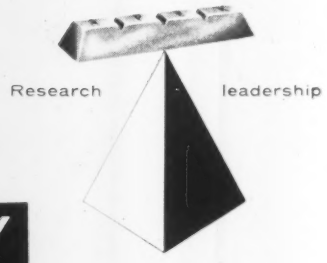
The Apex-Goss continuous cast rod assures UNIFORM RESIDUAL ALUMINUM AT LOWER COST

Your deoxidizing aluminum is quality controlled at Apex. All grades are produced at Apex with the RIGHT aluminum content to A.S.T.M. B37-57 grades 980A, 950A, 920A, 900A, and 850A, or to your own special specifications.

Apex 3-plant operation produces many shapes—you select shape and grade best adapted to your deoxidizing needs.

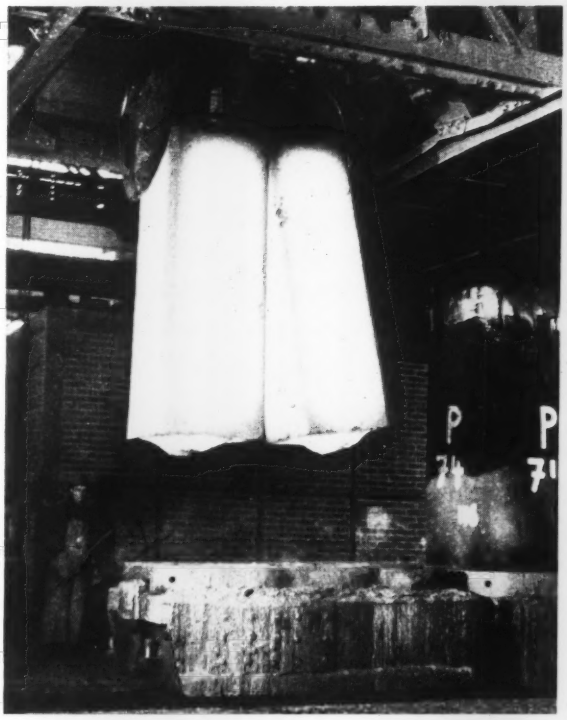
Rod—varied size and length
Notched Bar—one pound and up
Piglets—two ounce
Shot
Grain
Special Shapes—Cones, cylinders, gears, stars

Order Apex for dependable quality and fast service—35 years serving the steel industries.

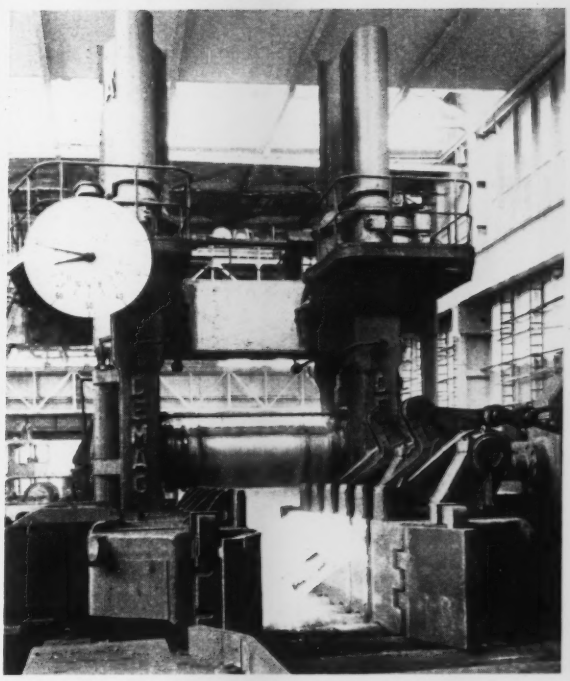


APEX SMELTING COMPANY
CHICAGO • CLEVELAND • LOS ANGELES
SPRINGFIELD, OREGON (NATIONAL METALLURGICAL CORP.)

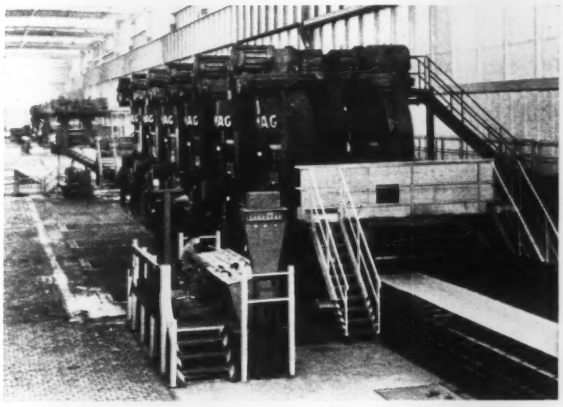
STEELMAKING . . .



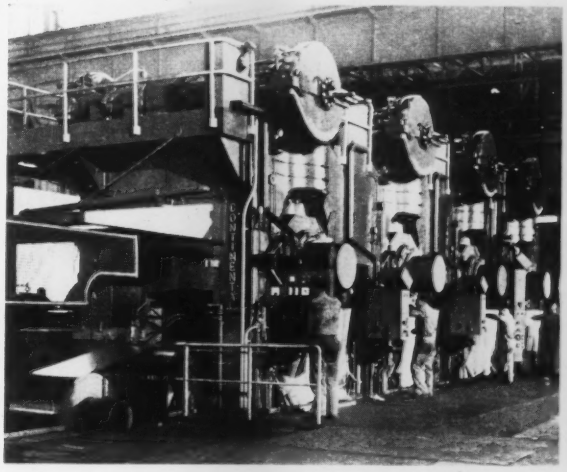
Stripper crane in the bessemer shop handles two 5-ton ingots at once. It's done to speed unloading the buggies, but is confined to the lighter ingots



After rolling in this blooming-slabbing mill (one of two with combined capacity of 330,000 tons a month), slabs are scarfed, then tested ultrasonically for soundness



Continuous hot strip mill is built over a coal mine. The mill has built-in leveling jacks to keep it true if the foundation settles



Tandem cold strip mill is geared to the growing European demand for more light gage, flat rolled products

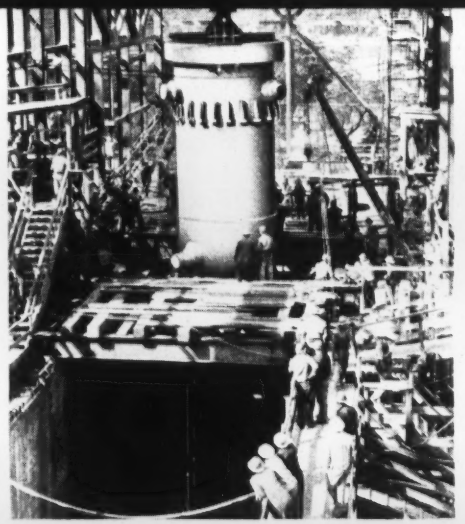
ing 3 million annual ingot tons.

U. S. Influence—Without denying the contribution of German persistence and capital, the firm also owes much to American knowhow, equipment, and Export-Import Bank financing. In particular, the comeback reflects the advice and supervision of Armco International Corp., the overseas arm of Armco Steel Corp.

If an American steelman were dropped into the middle of ATH, he would see plenty with a European flavor, but he would also see an unusual amount of stateside equipment and practice. In the pictures above and on Page 130 you can get a glimpse of this blend of German-American steelmaking in action.

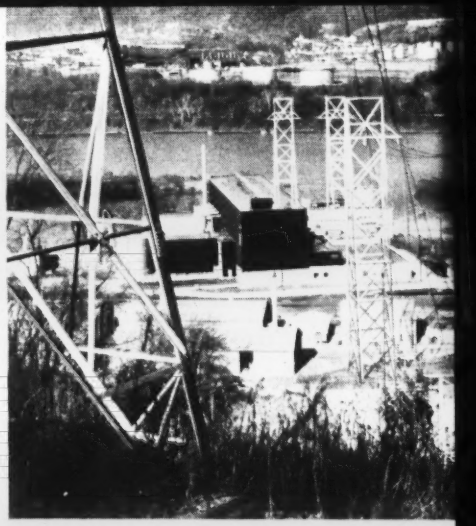
A Dravo workman is lowered into the stainless steel-lined reactor vessel at the Shippingport Atomic Power Station.

Early construction on waste disposal plant. It will handle all radio-active wastes originating in the atomic power plant.



Lowering 150-ton reactor vessel. Special field-designed suspension system positioned it with watchmaker's accuracy.

Typical portion of the 10 miles of piping (ranging from ½-inch to 18-inch diameter) installed in the reactor plant.



Plant went "on stream" December 18, 1957—and stayed "on stream"—a tribute to the men and companies who made it possible.

Dravo at work...Shippingport, Pa.

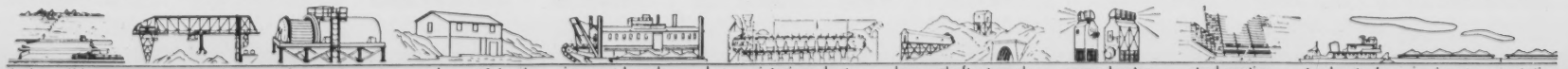
Dravo was selected more than two years ago to put together the vital nuclear system of the nation's first full-scale commercial atomic power plant. This part of the project required a force of 1100 men at the peak of construction. Dravo's responsibilities included installation of the reactor vessel, all mechanical and electrical equipment as well as fabrication and installation of complicated piping systems which form the "arteries" of the nuclear portion.

Now at full power and synchronized into the Duquesne Light System, the Shippingport project joins a long list of Dravo accomplishments in the field of special and difficult construction for industry and the nation. DRAVO CORPORATION, PITTSBURGH 25, PA.

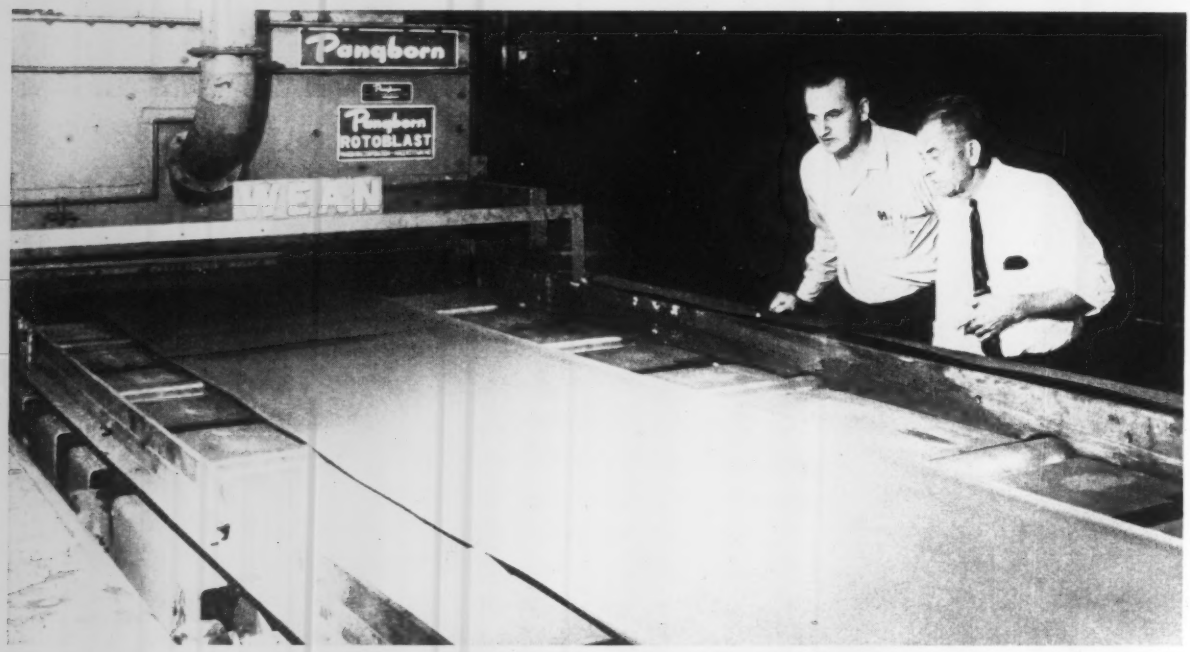
At Shippingport, Dravo was a subcontractor to Westinghouse Electric Corp., which designed and developed the nuclear reactor under contract with the Atomic Energy Commission. Duquesne Light Company, in addition to providing the conventional portion of the plant, is operating the entire facility.

DRAVO
CORPORATION

Blast furnace blowers • boiler & power plants • bridge sub-structures • cab conditioners • docks & unloaders • dredging • fabricated piping • foundations • gantry & floating cranes • gas & oil pumping stations



locks and dams • ore & coal bridges • process equipment • pumphouses & intakes • river sand and gravel • sintering plants • slopes, shafts, tunnels • space heaters • steel grating • towboats, barges, river transportation



Clean strip emerges from descaling unit. Blowoff at exit removes abrasive and descaling debris. One operator controls speed and quantity of steel shot thrown

Strip Descaled Automatically

Leveler, cutoff, and stock handling equipment are in line with Pangborn Rotoblast units. Setup works with coil and sheet stock. It has provision for 50 per cent expansion

SHOTBLASTING is taking the place of pickling at Midland-Ross Corp., Cleveland.

The firm has a continuous line which cleans steel coils and sheets up to 66 in. wide at 80 fpm. More than 14,000 tons of steel are handled each month.

Operation—The descaler, which incorporates eight Pangborn Rotoblast units, is in line with a leveler, shear, and stock handling equipment. The unit can be expanded. Addition of up to four Rotoblasts would increase capacity 50 per cent.

A small dolly delivers 15-ton coils to a mandrel. The strip is mounted and threaded into a pinch roll. If sheets are to be cleaned, a magnetic feeder carries them from storage to the rolls.

After leveling, pinch rolls carry the stock into the Rotoblast units where an abrasive stream scours top and bottom surfaces simultaneously.

Eight wheels throw 240 tons of steel abrasive an hour. (That cleans about 3200 sq ft.)

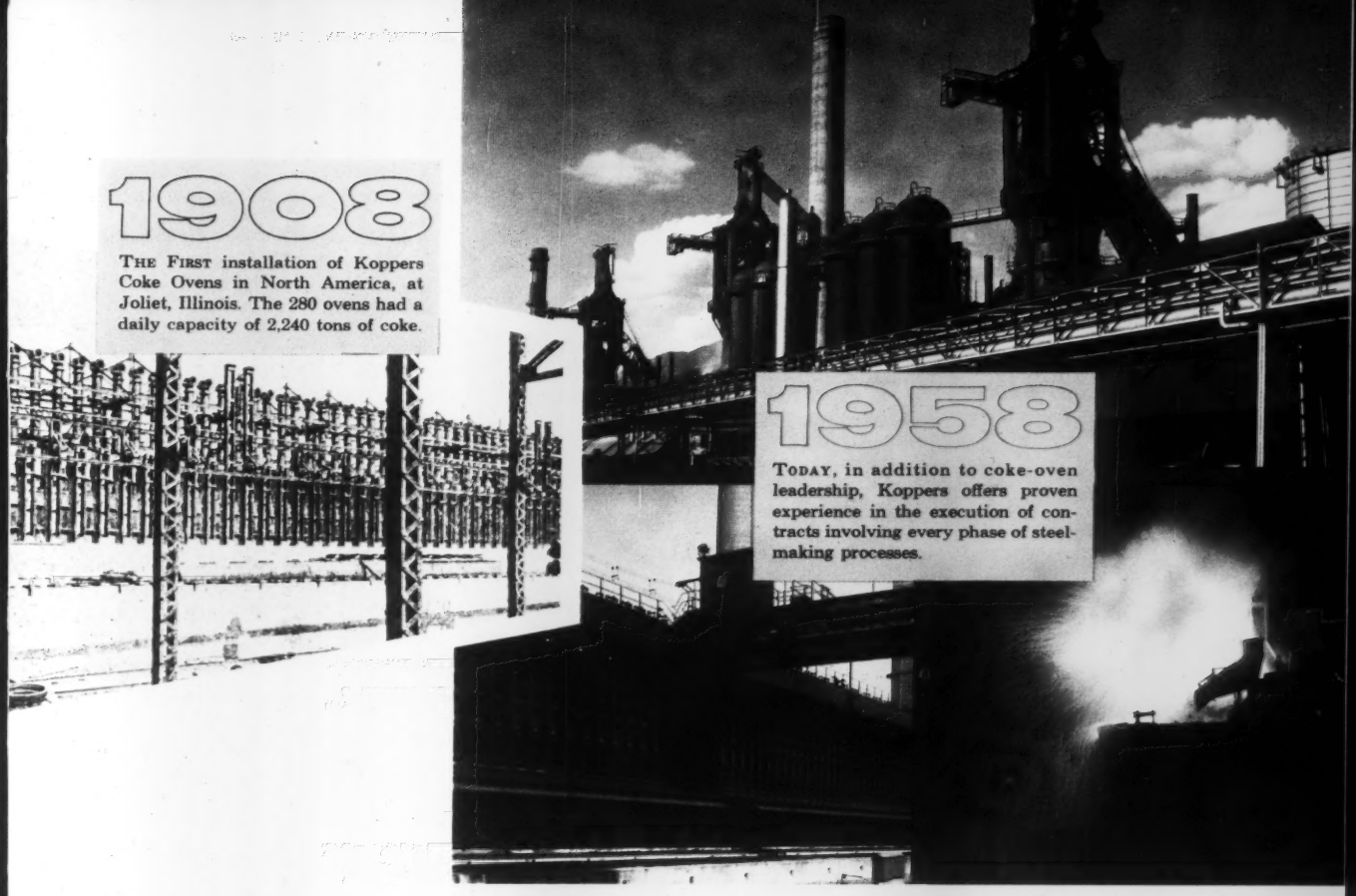
Adjustments—To handle sheets of varying widths, each wheel can be adjusted laterally from a control console to any of seven positions. A timer automatically starts abrasive flowing 10 seconds before a sheet enters the unit and stops it 10 seconds after the last one leaves.

Each wheel is housed separately and is protected by heavy rubber curtains and wear resistant alloy liners. (Not all abrasive hits the work—some from the top wheels hits a scrap filled pan; some from the bottom strikes wear plates.)

Shot Recovery — After the last blast station, an air stream is blown from a V-shaped tunnel through a narrow slot. Air hits the top of the sheet at a 60-degree angle. Velocity is about 17,000 fpm. Return air passes through a reclaimer which drops abrasive back into the machine. Spent abrasive and descaling refuse accumulate in a hopper. The material is carried by a worm conveyor to a separator. Large particles are removed by a scalping drum, small ones by a pneumatic air wash. Cleaned abrasive is returned for reuse.

Operation of the descaler is automatic. Controls are in a panel near the discharge end of the machine.

A powered roller conveyor carries cleaned sheets to a shear. Coiled strip can be cut into 8 to 24 ft lengths and at angles up to 20 degrees. Sheets are stacked magnetically.


1908
THE FIRST installation of Koppers Coke Ovens in North America, at Joliet, Illinois. The 280 ovens had a daily capacity of 2,240 tons of coke.
1958
TODAY, in addition to coke-oven leadership, Koppers offers proven experience in the execution of contracts involving every phase of steel-making processes.

KOPPERS

50 YEARS OF SERVICE TO THE STEEL INDUSTRY

ON JULY 27, 1908, the first American battery of Koppers by-product coke ovens was fired at the Joliet Works of the old Illinois Steel Company. Since that time, leadership in research and coke-oven technology has established Koppers as the world's leading designer and builder of coke ovens and related equipment.

In North and South America alone, Koppers has built 19,381 coke ovens—equivalent to a battery of 32 ovens *every month* since 1908. Right now, Koppers Coke Plant Department has under construction twelve more batteries, with 552 coke ovens.

Through the years, Koppers has broadened its activities to include the design, construction and start-up of most types of steel-plant installations. The Engineering and Construction Division has proved its ability, in thousands of contracts, to solve practically any construction problem encountered in the steel industry.

On the next few pages, you will find highlighted some of the Koppers services which can expedite your expansion or rebuilding plans.

ENGINEERING AND CONSTRUCTION DIVISION

COKE PLANT DEPARTMENT

FREYN DEPARTMENT

CHEMICAL DEPARTMENT

YEARS OF ENGINEERING AND CONSTRUCTION SERVICE

1908···1958

HOW KOPPERS SERVES THE STEEL INDUSTRY ■

19,381 COKE OVENS. Fifty years ago, Koppers Coke Ovens became the standard by which other coke ovens were judged. Ovens built by Koppers remain in first position today . . . because of improvements such as oven walls made of Hammerhead brick, waste-gas recirculation, precise control of combustion, and design that permits efficient heating with coke-oven, blast-furnace or other lean gases.

Koppers has designed and built 19,381 chemical-recovery coke ovens in the Western Hemisphere alone. Many thousands more have been installed in other parts of the world.

COAL-CHEMICAL RECOVERY. The dephenolizing plant shown at the left is one of four such plants designed and constructed by Koppers. Installed at a large Midwestern steel plant, it is capable of removing 98% or more of the phenols from crude ammonia liquor.

The Coke Plant Department of Koppers is skilled and experienced in all problems associated with coke-plant design, construction and operation. Koppers engineers can help you with the planning, installation, and operation of coal and coke preparation and handling systems, coal-chemical recovery plants, and all other coke-plant equipment.

.TODAY

ANY JOB...ANYWHERE... WELL DONE

Koppers and its Freyn Department have the proven ability to handle the engineering and construction work involved in all phases of steelmaking.

Koppers personnel have *actual experience*, around the world, in the design and installation of blast furnaces, ore-handling facilities, sintering plants, open-hearth shops, rolling mills, continuous-casting units, electric-furnace shops, mold foundries, and other equipment.

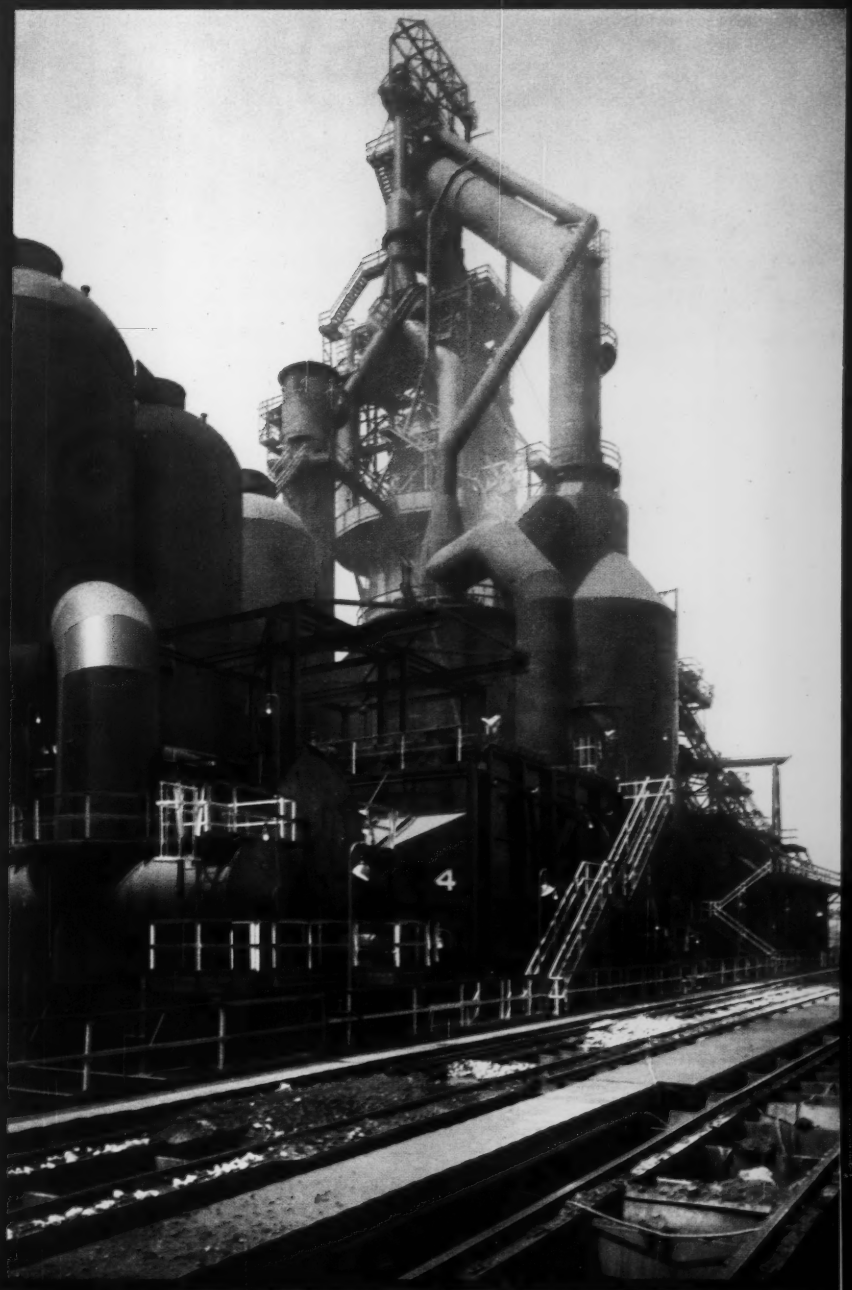
96 BLAST FURNACES, by Freyn and foreign associates, are currently in operation throughout the world. The furnaces have a total annual capacity of more than 27 million net tons.

91 SINTERING MACHINES, designed by Koppers American Ore Reclamation Section (AORCO), are in active service in eight countries. Total annual capacity of these machines is over 32 million net tons. Sixteen more AORCO machines with a total annual capacity of over 14 million tons are currently on order and will be completed by 1959. Koppers is now installing two 12-foot-wide sintering machines, both of which will be larger than any now in operation.

76 OPEN-HEARTH FURNACES have been designed and engineered by the Freyn Department since 1942. Forty-one of these installations are in the United States, including seven 350-ton furnaces completed recently for a large Eastern steel plant.

CONTINUOUS CASTING OF STEEL was pioneered in North America by Koppers. The first commercial-scale installation on this continent was designed and constructed in 1954 by the Freyn Department.

Freyn-Design assures you that the men handling your construction work understand the steel industry and its problems . . . and have the ability and experience needed to tailor an installation to your special requirements.



FROM KOPPERS . . .

CHEMICAL PLANTS TOO !

Experience—Koppers has a wide variety of experience in the design and installation of chemical plants. Engineers of the Chemical Department have built plants to distill tar . . . to reform gas . . . and to produce styrene monomer, polystyrene, polyethylene, ammonia, and a variety of other chemicals.

Recently the Chemical Department has completed a new coke-oven light-oil purification plant based on hydrogenation to remove sulfur and other compounds. It is the largest such unit in the world. Koppers also has made available to the steel industry a new process for the *recovery and regeneration* of waste acid in steel-pickling operations.

WHAT does it all mean TO YOU?

The three departments of Koppers Engineering and Construction Division bring you a unique combination of experience and service.

They bring you actual proof of performance in the planning, construction and operation of nearly every type of steel-plant installation.

They bring you a rich background of operating know-how in metallurgical, coke, and chemical plants, gained through Koppers own production experience.

They bring you the vast staff resources available only from a large and diversified company such as Koppers. They can call on experts to assist you in market research and development . . . and in purchasing and other problems.

In addition, they bring to steelmakers the results of constant exploration of new techniques and processes evolving from continuous research and development.

Investigate Koppers and its ability to serve you.

YEARS OF ENGINEERING AND CONSTRUCTION SERVICE

1908···1958

KOPPERS®

KOPPERS

ENGINEERING AND CONSTRUCTION

Speeds Shaftmaking

Induction hardening in production line takes less space, simplifies operations

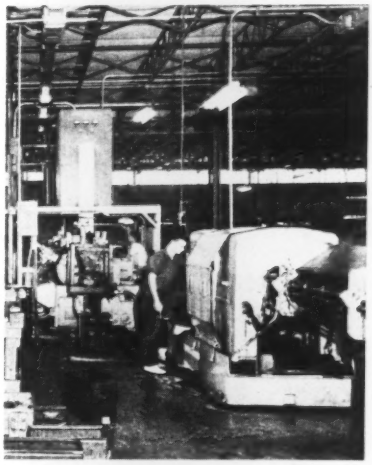
A NEW production line at Monroe Auto Equipment Co.'s Hartwell, Ga., plant turns out about 500 shock absorber shafts an hour.

Processing includes turning on automatic bar machines, induction hardening, and grinding.

Saves Floor Space—The bulk of the equipment for each of the three General Electric 40-kw induction heaters is mounted over the assembly line on a platform. It takes less floor space than the former hardening process (chrome plating).

A transmission line runs from the balcony to a line below which connects to an output transformer.

Process—In manufacturing the equipment, parts are formed on bar machines, then pass through a centerless grinder, induction heater fixture, water quench, two centerless grinders, and a final lapping machine.



INDUCTION HEATER
. . . mounted on top saves space

The line requires only two operators—one to feed stock to the bar machine and one to check finished parts after lapping.

Monroe supplies Load Leveler shock absorbers to automakers. The firm's main plant is in Monroe, Mich. The Hartwell plant was established as a step in Monroe's effort to diversify and spread operations over a wider area.

Tape Cuts Milling Cost

Tolerances as close as ±0.0005-in. and faster output combine to help a profiling machine pay off at Lockheed. Company says it had only two shutdowns in four months

IF YOU'RE waiting for numerical controls to be proved in production, you can now draw conclusions from a fair-sized list of success stories.

Take the case of the multiple-axis profile milling machine at Lockheed Aircraft Co., Burbank, Calif.

Record Buster—Production is as much as 75 per cent better than it was on older equipment. Costs run 75 to 90 per cent under what they were on some complex parts.

A cost study shows a 69 per cent saving on two lots (164 pieces) the first time the part was produced. On an 85-piece single lot, a 61 per cent saving was recorded. A part that originally cost $69.50 is being machined for about $15.70, including a few operations that follow profiling.

Maintenance—Dr. L. H. Ferrish, Lockheed's co-ordinator of numerical control, says: "Only a vacuum tube voltmeter is needed to service the system. After four months of continuous operation, only two minimum-time work stoppages (to replace two tubes) were required, indicating that the GE-built system is practically trouble-free."

Built at Giddings & Lewis Machine Tool Co., Fond du Lac, Wis., the machine is turning out major parts for Lockheed's F-104 jet Starfighter. When running at full capacity, it will crop 21 days off the scheduled production time for a plane.

AMC Notes

The Air Materiel Command says a program to convert Cincinnati fin milling machines to general purpose, tracer controlled duplicators has been started in the Los Angeles Air Procurement District. There are about 123 of these machines in government storage sites. Utility Metal Products Inc., Pasadena, Calif., has leased five for this purpose. Cost of the conversion is about $15,000. Cost of the converted machine will be roughly $60,000, with a leadtime up to 24 months.

The potential savings of the program should run close to $30 million, figuring the cost of converted machines versus that of new machines.

Throwaway Economy — Production men at Solar Aircraft Co. are using worn disposable cutter tips by brazing them on holders. Worn tips also are reground to a larger radius. The two steps have saved an estimated $29,000 a year on new tool purchases.

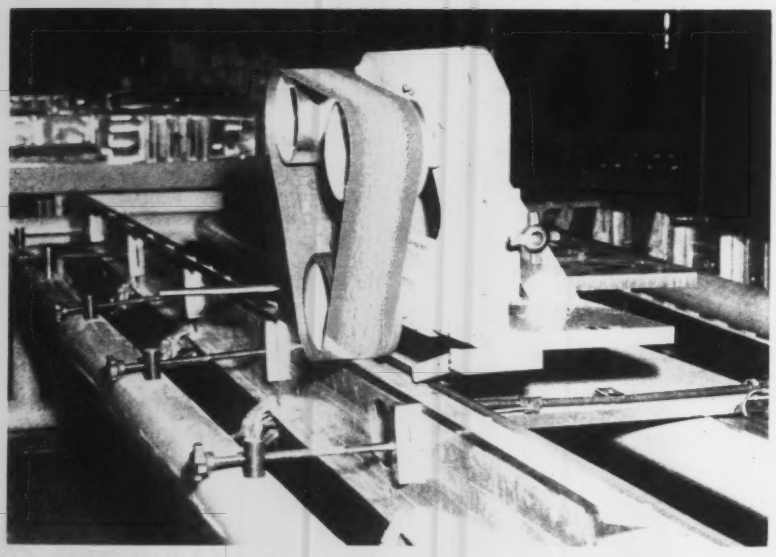
Sales School Set

The annual sales conference for members of the National Machine Tool Builders' and the American Machine Tool Distributors' Associations is scheduled for Purdue University, Lafayette, Ind., the week of July 28.

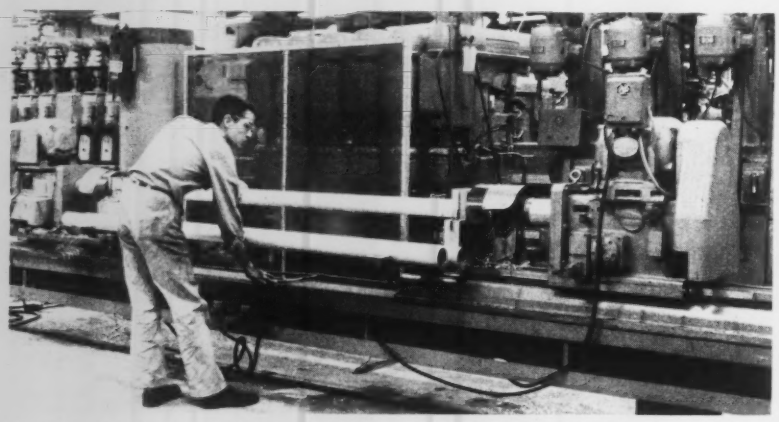
Control Tape Service

Magnetic tapes that guide your machine tools may become as easy to get as color movie film. Robert C. Tait, president, Stromberg-Carlson Div., General Dynamics Corp., Rochester, N. Y., has announced plans for an automation data service to supply the operating tapes.

Users will specify machining operations, taking data from the blueprints and will prepare a punched paper tape for permanent record. The tape will be sent to the nearest processing center for conversion to magnetic tape. It means potential users who can't afford the electronic equipment to make the conversion can farm out the work on a fee basis.



SANDING MACHINE: Beam is held in position by series of clamps



BORING MACHINE: It does job in 30 seconds that took 5 minutes

Ingenuity Pays Off

HERE are two production ideas that could give you savings in machining time and money. They're from Chance Vought Aircraft Inc., Dallas.

No. 1 — The problem involved hand filing a main beam for the wing of an F8U-1 Crusader to a crest tolerance of 0.001 in. Solution: A belt type sanding machine was made from salvaged parts. The production rate was quintupled.

No. 2—The problem involved facing and boring thousands of 10-ft rocket tubes in a hurry. The job took 5 minutes on a turret lathe. Solution: A boring machine developed by the company holds the tubes in an air clamp while both ends are worked simultaneously in 30 seconds. A central control box enables the operator to install tubes and bore out both ends with minimum waste motion.

Halves Welding Time

Automatic equipment replaced hand methods. Quality is better; fitup problem solved

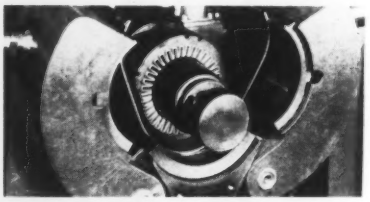
THE machine in the illustration forms and welds a steel wrapper for the stator cores of fractional horsepower electric motors.

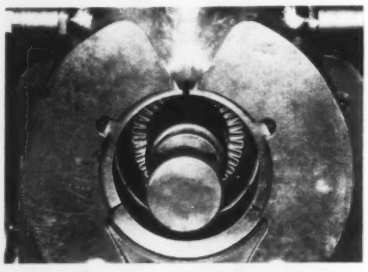
It replaces a hand-operated rolling machine and a welder, and produces the part in half the time.

Built by Standard-Modern Tool Co., Toronto, Ont., the machine incorporates an argon shielded, automatic welder (sigma) which permits more latitude in fitup and material thickness. The welds it produces need no cleaning.

The Works — In production, a stator, complete with windings, insulation and connection lugs, is placed on the mandrel. A preformed wrapper is placed on the forming jaws. The bottom die rises against the underside of the wrapper while the side jaws swing into position. This aligns two, hardened, socket-type inserts. Hydraulic cylinders force the jaws together, placing the ends of the wrapper in position for welding.

As soon as the jaws have closed, welding starts automatically. When the single pass weld is complete, the welding head returns to the starting position and shuts itself off. At the same time, all three jaws open and the completed assembly is ejected.

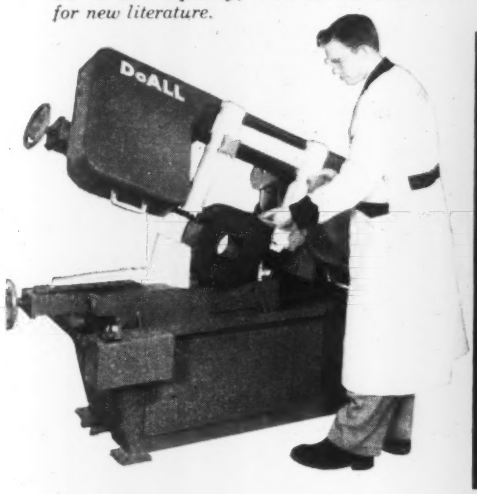


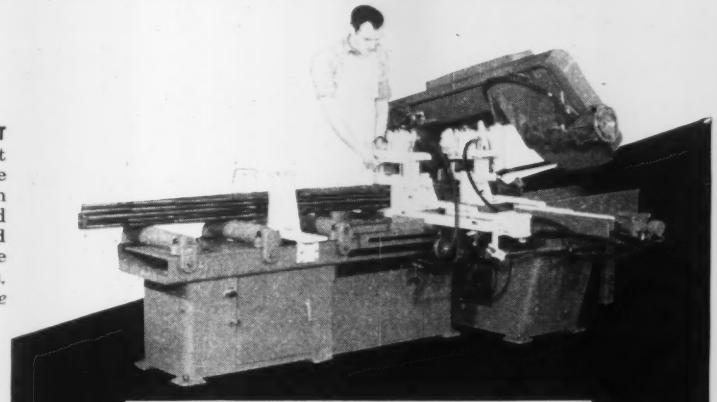


The steel wrapper for motor stator is in place (above). Closing jaws starts automatic welder (below)

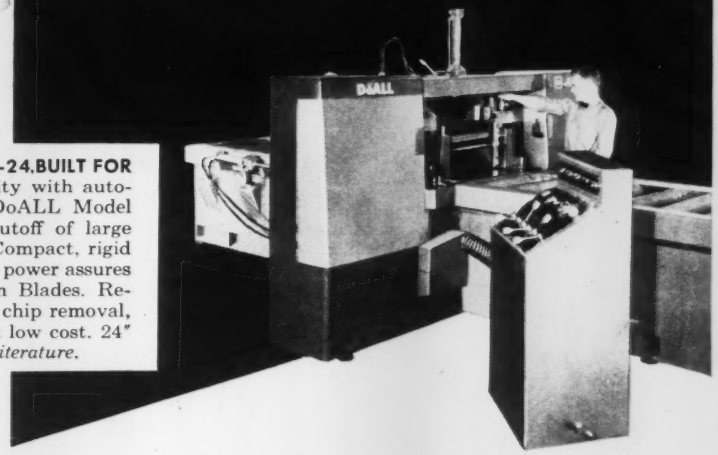
Before you buy any cutoff saw—
see these NEW DoALL POWER SAWS

NEW MODEL C-12, ACCURACY AT LOW COST Ideal for small shops or for intermittent production. Ample power and rigidity assure maximum performance from Demon High Speed Steel Blades. This model cuts mild steel at 10 sq. in. per minute. Unsurpassed for accurate machining of tough, expensive steels, pipe, structurals, etc. Four speeds. 12" x 12" capacity, manual control. *Write for new literature.*





NEW MODEL C-58, HIGH PRODUCTION, COMPLETELY AUTOMATIC World's fastest automatic cutoff sawing—easily adapted with standard attachments to meet any specific production requirement. Designed expressly for Demon High Speed Steel Blades. Infinitely variable speeds. 12" x 12" capacity. Also available in Model C-57, with manual control. *Write for new literature.*



NEW AUTOMATIC MODEL C-24, BUILT FOR YOUR BIG JOBS Giant capacity with automatic operation makes the DoALL Model C-24 excellent for low-cost cutoff of large billets, pipe and structurals. Compact, rigid design combined with extreme power assures full performance from Demon Blades. Reversible conveyors, automatic chip removal, automatic control available at low cost. 24" x 24" capacity. *Write for new literature.*

Ask About Our Lease Plan!

DoALL originated the leasing of machine tools. Its successful operation for many years can mean immediate savings to you. All DoALL machine tools can be leased at low rental with purchase option.

This is a typical DoALL Store

You name the cutoff job *and DoALL will show you how to cut it faster, cheaper and more accurately than any other machine can do today!*

Better still, DoALL will provide the exact type and size band machine you need to fit your budget—whether it's for smallest toolroom jobs or high-production runs.

DoALL *integrated design* is the secret—powerful, rigid band machines designed to get the full performance from world-famous DoALL Demon High Speed Steel® Blades. This engineered combination gives you up to six times the cutting speeds of other band saws . . . up to twice the speeds of power hack saws of comparable capacity. Find out *how* you can save time and labor, reduce cutting-tool costs, minimize material waste and hold down your capital investment. Call your DoALL Store today, or write The DoALL Company, Des Plaines, Illinois.

PS-12

THE DoALL COMPANY, Des Plaines, Ill.

Boosting Production Efficiency

To get the concepts of "machinability" applied in its plant, management at GE's Direct Current Motor & Generator Dept., Erie, Pa., used a training program. Here are Mr. Brice's comments on it.

WE STARTED our formal machinability course in February, 1957, with 23 men. We picked representatives of all four of our product manufacturing areas. They included factory supervisors, methods, planning, time standards, tool design, cost improvement specialists, and one foreman.

The course took ten 3-hour sessions. It helped students develop proper feeds, speeds, and tool life to get maximum machining efficiency. It also taught them how to figure the savings that resulted from the proper application of machinability, especially in converting from present tools to negative-type disposable toolholders and carbide bits. Cost of conducting the course: $3500.

Machinability projects (involving actual shop jobs) were assigned to each team at the start of the class and were worked on continuously throughout the course. Records of the savings were kept and reported at graduation ceremonies.

One foreman was placed in the first course as an experiment. It was believed that the immediate job would be to train the planning and plant management personnel.

We learned that the foreman should get in on it at the start. When he is sold on machinability and knows what to do with it, he goes straight to his own area and begins to put it to work. The time for translation from learning to savings is much less when foremen or other direct shop supervisors are included. We'll put increasing emphasis on this in the future.

One prerequisite to the program is continuity. The basic courses will be continued until the concept of machinability is sold to all the personnel who can use it. Then we'll conduct regular refresher courses, probably several a year, to keep our men informed on new tooling ideas and to remind them of the importance of machinability.

How We Saved $75,000 in Three Months

All it took was better tooling. The two steps: Disposable cutting tips and optimum machining speeds. A ten-session training course got the program underway

By H. J. BRICE
Manufacturing Engineer
DC Motor & Generator Dept.
General Electric Co., Erie, Pa.

OUR 1957 machinability program was aimed at trimming production costs. We used it to cut tool costs, boost machine productivity, eliminate tool grinding, and reduce downtime for tool changing.

Twofold—The program has two essential elements. We replaced brazed carbide, single point tools with disposable tool inserts where it was practical. (About 35 per cent of our tools were converted.) Speeds were refigured to get the lowest machining cost per part produced. The two steps netted us $75,000 in production savings in three months.

Disposables—Most advantages of these tools are well known. Elimination of tool grinding and the reduction of tool change time predominate.

We have found another advantage that is often missed when the switch from brazed to disposables is

made. Disposables give a marked improvement in the optimum rate of removing metal. We figure that the improvement averages about 50 to 75 per cent. The big reason: There are no heat cracks, such as those often present in brazed tools, to cause failure.

There's a second reason: Disposable tips are ground under closely controlled conditions at the carbidemaker's plant. Tool shape is more precise and consistent than we can economically produce in our own grinding department.

Speeds—What's the right speed to run a job? We're looking for the one that will give us a minimum machining cost.

We reason it this way. As the cutting speed and feed are increased, it takes less time to make a cut, so machine cost per piece drops. But as speed and feed go up, tool life gets shorter. Tool cost per part becomes higher.

The speed we're looking for is the one that will give us the best compromise between dropping machining costs and rising tool costs.

We use a worksheet to figure out this speed. The exhibit at right shows how it's done.

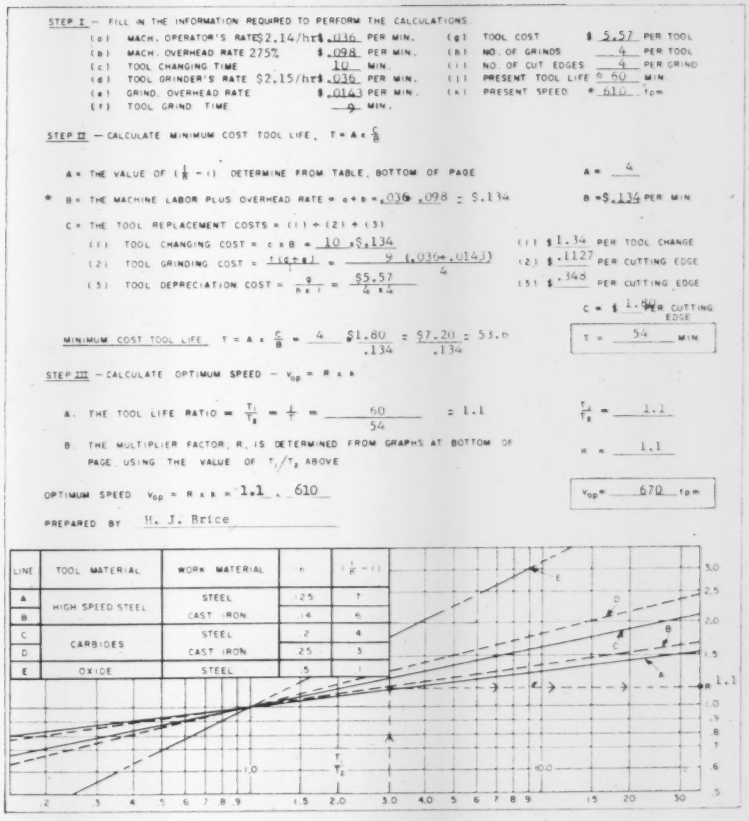
Example — This will give you a rough idea of the savings we are getting: On our magnet frames we must rough turn, finish turn, face, and counterbore. Assuming a yearly production of 3600 frames, the tool savings made possible by insert tooling on the rough turning operation alone would be $1295.

It figures like this: The original cost of the brazed tool was $3.59. Four grinds at $1.75 each come to $7. Total cost is $10.59; the cost per edge for five edges (original, plus four regrinds) comes to $2.12.

Original cost of the disposable toolholder was $10. The disposable tip cost $1.37; its eight edges give a cost per edge of about 17 cents. Figuring 100 edges as holder life (10 cents per edge), the total cost per cutting edge is 27 cents, or $1.80 less than with the brazed tools. We get about five parts per edge, so the total savings in a year would come to $1295.

The example is typical of many changes we've made, but it's not extreme. On another operation, boring the magnet frames, our savings are even more dramatic.

Example—You may have to mod-


STEP I — FILL IN THE INFORMATION REQUIRED TO PERFORM THE CALCULATIONS.

(a) MACH. OPERATOR'S RATE $2.14/hr $.036 PER MIN. (g) TOOL COST $ 5.57 PER TOOL
(b) MACH. OVERHEAD RATE 275% $.098 PER MIN. (h) NO. OF GRINDS 4 PER TOOL
(c) TOOL CHANGING TIME 10 MIN. (i) NO. OF CUT EDGES 4 PER GRIND
(d) TOOL GRINDER'S RATE $2.15/hr $.036 PER MIN. (j) PRESENT TOOL LIFE * 60 MIN
(e) GRIND. OVERHEAD RATE $.0143 PER MIN. (k) PRESENT SPEED * 610 fpm
(f) TOOL GRIND TIME 9 MIN.

STEP II — CALCULATE MINIMUM COST TOOL LIFE, $T = A \times \frac{C}{B}$

A = THE VALUE OF $(\frac{1}{n} - 1)$ DETERMINE FROM TABLE, BOTTOM OF PAGE — A = 4

* B = THE MACHINE LABOR PLUS OVERHEAD RATE = a + b = .036 + .098 = $.134 — B = $.134 PER MIN

C = THE TOOL REPLACEMENT COSTS = (1) + (2) + (3)

(1) TOOL CHANGING COST = c × B = 10 × $.134 — (1) $1.34 PER TOOL CHANGE
(2) TOOL GRINDING COST = $\frac{i(g+k)}{j}$ = $\frac{4\ (.036+.0143)}{4}$ — (2) $.1127 PER CUTTING EDGE
(3) TOOL DEPRECIATION COST = $\frac{g}{h \times i}$ = $\frac{\$5.57}{4 \times 4}$ — (3) $.348 PER CUTTING EDGE

C = $ 1.84 PER CUTTING EDGE

MINIMUM COST TOOL LIFE $T = A \times \frac{C}{B} = \frac{4}{1} \frac{\$1.80}{.134} = \frac{\$7.20}{.134} = 53.6$ — T = 54 MIN

STEP III — CALCULATE OPTIMUM SPEED — $V_{op} = R \times k$

A. THE TOOL LIFE RATIO = $\frac{T_1}{T_2} = \frac{1}{t} = \frac{60}{54} = 1.1$ — $\frac{T_1}{T_2}$ = 1.1

B. THE MULTIPLIER FACTOR, R, IS DETERMINED FROM GRAPHS AT BOTTOM OF PAGE, USING THE VALUE OF T_1/T_2 ABOVE — R = 1.1

OPTIMUM SPEED $V_{op} = R \times k = 1.1 \times 610$ — V_{op} = 670 fpm

PREPARED BY H. J. Brice

LINE	TOOL MATERIAL	WORK MATERIAL	n	$(\frac{1}{n} - 1)$
A	HIGH SPEED STEEL	STEEL	.125	7
B		CAST IRON	.14	6
C	CARBIDES	STEEL	.2	4
D		CAST IRON	.25	3
E	OXIDE	STEEL	.5	1

What's the Right Speed?

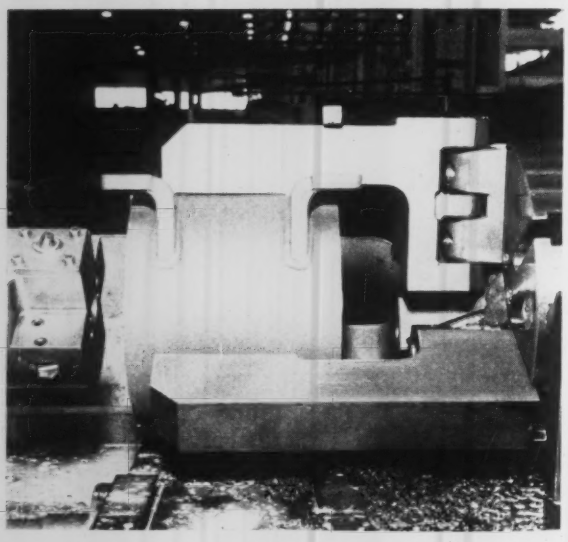
HERE is a sample worksheet used at GE to determine the speed that will give the lowest cost per part machined.

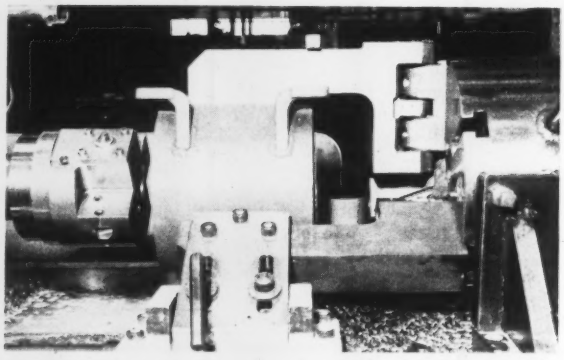
First, it tells the tool life that will give the lowest cost per piece. It takes into account both the machine and the tooling costs.

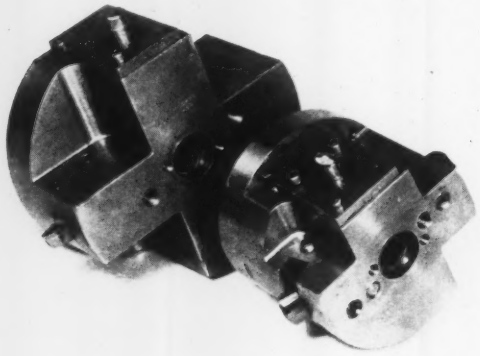
Second, it uses this optimum tool life to compute the speed at which the job should be run.

How To Use It—First, fill in the required data which are necessary for subsequent calculations. Next, calculate A and B and use them to calculate C, the minimum-cost tool life.

You can figure the speed that will give this tool life by multiplying the present machining speed times factor R. Determine R from the chart at the bottom of the sheet. Finding the ratio T_1/T_2 at the bottom of the chart, draw a vertical line from that point to the line that represents the tool-work material combination being used. Now move horizontally to the right hand scale to find R.







Fixture above didn't support the piece properly. Adjustable braces added (top right) gave the necessary rigidity. Hinged top jaw swings away for fast loading and unloading. Photo at right shows the boring head. Brazed tips (rear) were changed to disposables for a tool cost reduction. It also now takes less time to change the tools. The inserts will index to within 0.002 in.; and the tolerance on the part is 0.005 in.

ify the whole setup to make it pay off in full. The original holding fixture on a boring machine had three independent jaws. Two side jaws adjusted to the diameter of the frame being machined. The third jaw was mounted overhead on a crossbar and screwed down to hold the frame.

The crossbar mounted on posts, front and back, and swiveled out of the way so frames could be easily loaded and unloaded.

Variations in frame diameters and out-of-roundness made it necessary to adjust the fixture for each workpiece. Alignment took a lot of time, and some frames had to be rejected because the bore was not concentric with the outside diameter.

To replace this fixture, we put in a three-jaw universal chuck with the top jaw hinged so we could get the parts in and out. The chuck was supported on the side by angle plates. This took care of concentricity.

Then we discovered we were getting elliptical movement during boring that caused excessive tool breakage. The consensus was that the machine was too light for the job.

We put two roughing tools and a finishing tool in the boring heads on a 15-degree axis. We gave the tools 30-degree lead angles, so that when they're mounted in the heads, the effective lead is 15 degrees.

Next, we added adjustable braces on the outer parts of the bottom jaws. They are tightened after the frame is chucked, giving added support to the frame and easing the strain on the chuck. This put rigidity back in the holding fixture and reduced tool breakage.

A switch in carbide grade from Carboloy 350 to Carboloy 370 got rid of chipping from high frequency vibrations we were getting on finish cuts.

Finally, we altered two standard disposable insert holders so our roughing tools cost 71 cents per edge, compared with $7.12 for special cutters.

Four boring heads cover the range of part sizes. Toolholders are left in each head. Resetting is not needed when jobs are changed. Inserts will index within 0.002 in. Tolerance on the part is 0.005 in.

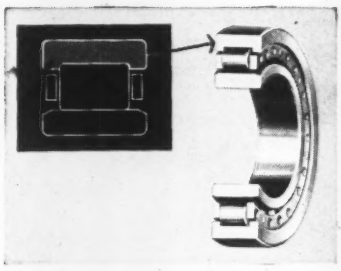
A disposable standard insert holder for finish machining has been made from a Microbore cartridge. This insert costs 44 cents an edge. It replaces an $8 cartridge with a brazed tip, again saving time in setups and tool changing.

Although the analysis of the job and the steps taken to improve it may sound complex, the whole task was inexpensive. We spent $150, but we're saving $7734 a year on this job alone.

Results—At the start of our program, we guessed it could save us $100,000 a year. We know now that we were conservative. The estimate was at least 30 per cent under what we accomplished last year.

The savings we got will continue to benefit us. What's more, since we're continuing our training and refresher courses (see exhibit, Page 144), we intend to increase our gains. We're sure that as long as we continue to remind our production and planning supervisors of the importance of good machining techniques, and to demonstrate that the small initial cost of finding the best method is soon paid back, we'll be upgrading our production efficiency and improving product quality.

Loggers' "weight-lifter" tests bearing stamina!



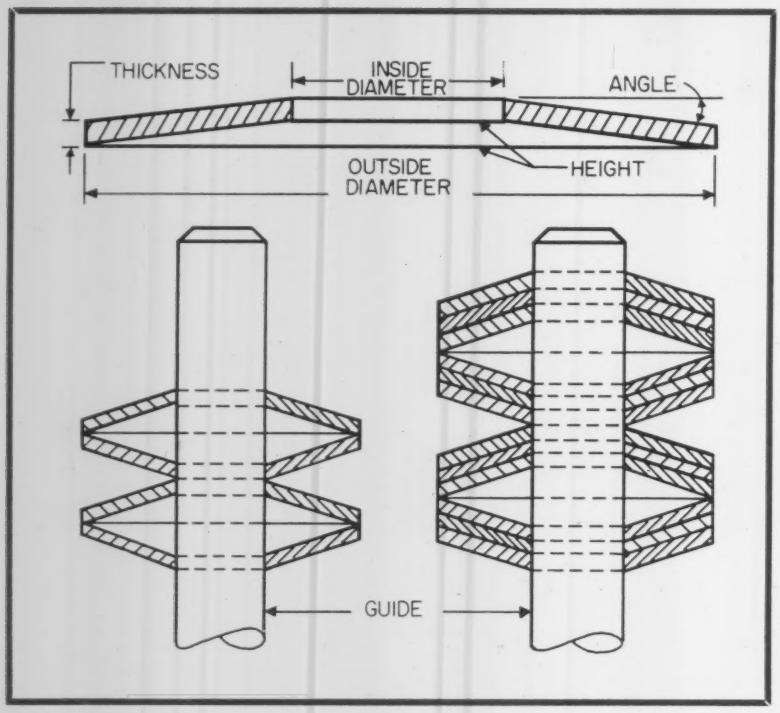
TWO-LIP RACE INCREASES RIGIDITY

Two parallel shoulders made integral with the outer race, as shown in gray above, increase rigidity and durability—keep rollers in proper alignment. Precision-ground rollers and races give quieter, smoother operation.

Tossing around logs 6 feet in diameter like toothpicks is no job for a softie! This machine has to be *built* for it right from the start—*right down to the bearings*. And that goes, too, for the trucks which haul these back-breaking giants over the most rugged terrain. Bower tapered and straight roller bearings have been *engineered* for just such work as this—to last longer, perform better under any road or load condition. Painstaking quality control plus basic bearing design refinements—like those shown at left—have reduced Bower Bearing failure to a practical minimum. *Whatever* your product, if it uses bearings, specify Bower! There's a complete line of tapered, straight and journal roller bearings for every field of transportation and industry.

BOWER ROLLER BEARING DIVISION
FEDERAL-MOGUL-BOWER BEARINGS, INC. • DETROIT 14, MICHIGAN

BOWER ROLLER BEARINGS



A series of dished washers like these make excellent high powered springs. Using them as sandwiches of two or three thicknesses increases power. Center rod is needed as a guide

Springs Fit Tight Spots

By FEDERICO STRASSER
Santiago, Chile

WASHER springs solve the problem of getting a lot of power into a small space.

They are needed in stamping dies to actuate shredders, strippers, and knockouts. They work in cavities too small for helical springs, hydraulic, or pneumatic cushions. Other advantages: Cost is low; and they're reliable.

Description — Washer springs are a series of plain dished washers. Characteristics depend on outside diameter, inside diameter, and material thickness. Most important is the relationship between washer height and metal thickness. For best results, make the height (less the metal thickness) 1.41 times the metal thickness.

Other Factors — Keep the outside diameter between two and four times the inside diameter—the best figure is three times. Combined with the height you've selected, the angle between the washer and a flat base will be between 4 and 7 degrees. Selecting inside and outside diameters which leave too little metal promotes cracking; selecting diameters which leave too much decreases elasticity.

Method—To help you decide on size, here's how to determine maximum pressure of each washer in a column: First, divide inside diameter of the washer by its outside diameter. Compare the result with the line d/D in the chart (below.) Select the closest figure. Take the matching "m" number and multiply it by the metal thickness in inches times 200,000 (less if it's for hot work).

d/D	0.25	0.30	0.33	0.35	0.40	0.45
m	2.07	1.85	1.74	1.70	1.56	1.46

Precipitators Get Help

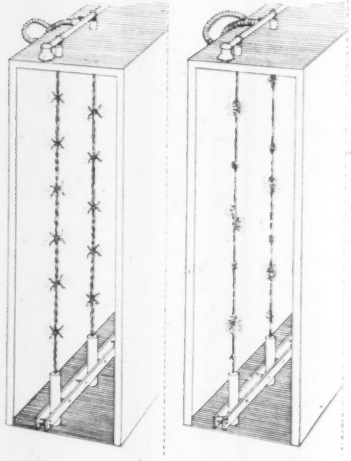
Barbed wire electrodes cut dust buildup, ease arcing problem. Increased efficiency results

ELECTROSTATIC precipitators lose efficiency as air pollution control devices when dust clings to electrode wires. Users can remedy the trouble (called arcing) by substituting barbed wire for straight wire electrodes, advises the Metal Products Div. of Koppers Co. Inc., Baltimore.

A typical precipitator consists of an alternating series of highly charged electrodes and grounded plates. As dust-laden gas passes through the precipitator, some of the dust always clings to the electrode wires, where it acts as insulation and concentrates the current discharge in clean areas. This discharge (corona) builds up and flashes over to the collecting plates unless the current is cut back.

The idea behind barbed electrodes is to establish a lot of little controlled coronas at the barbs, instead of a few big ones at bare spots on a smooth wire. It works because dust won't build up on the barbs. Current can be stepped up to get greater efficiency, or a precipitator can be made smaller.

The electrodes were tested at an east coast steel plant and abroad. They will be installed by McLouth Steel Co., Trenton, Mich., and New Jersey Zinc Co., Palmerton, Pa.



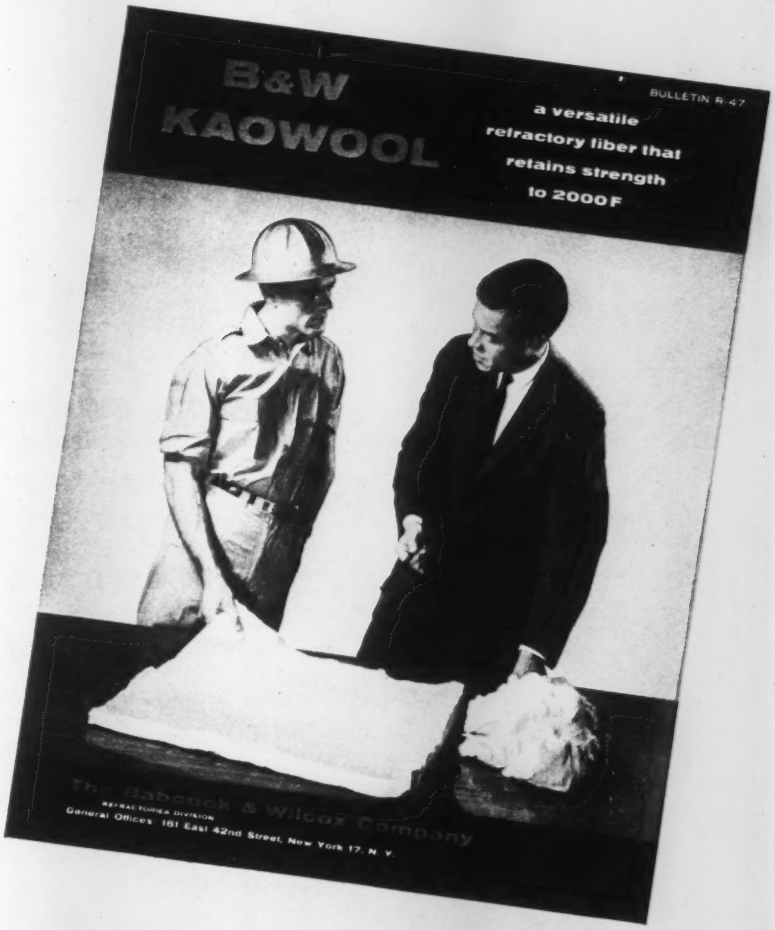
Barbed electrodes (left) and straight electrodes (right) show what happens to the corona pattern when dust collects on the electrodes in an electrostatic precipitator

New Bulletin on

B&W KAOWOOL

Gives data on many uses of 2000 F refractory ceramic fiber

B&W Kaowool, the 2000 F refractory fiber, is being successfully used for expansion joints in walls, roofs, around burners and in car tops of ferrous and non-ferrous heating furnaces. B&W Kaowool blankets are also serving as insulation in the pre-heating and stress relieving of large welded units. Write for new bulletin giving helpful data on B&W Kaowool, the multi-purpose ceramic fiber that withstands high temperature service.


B&W
KAOWOOL
BULLETIN R-47
a versatile refractory fiber that retains strength to 2000 F
The Babcock & Wilcox Company
REFRACTORIES DIVISION
General Offices: 161 East 42nd Street, New York 17, N. Y.

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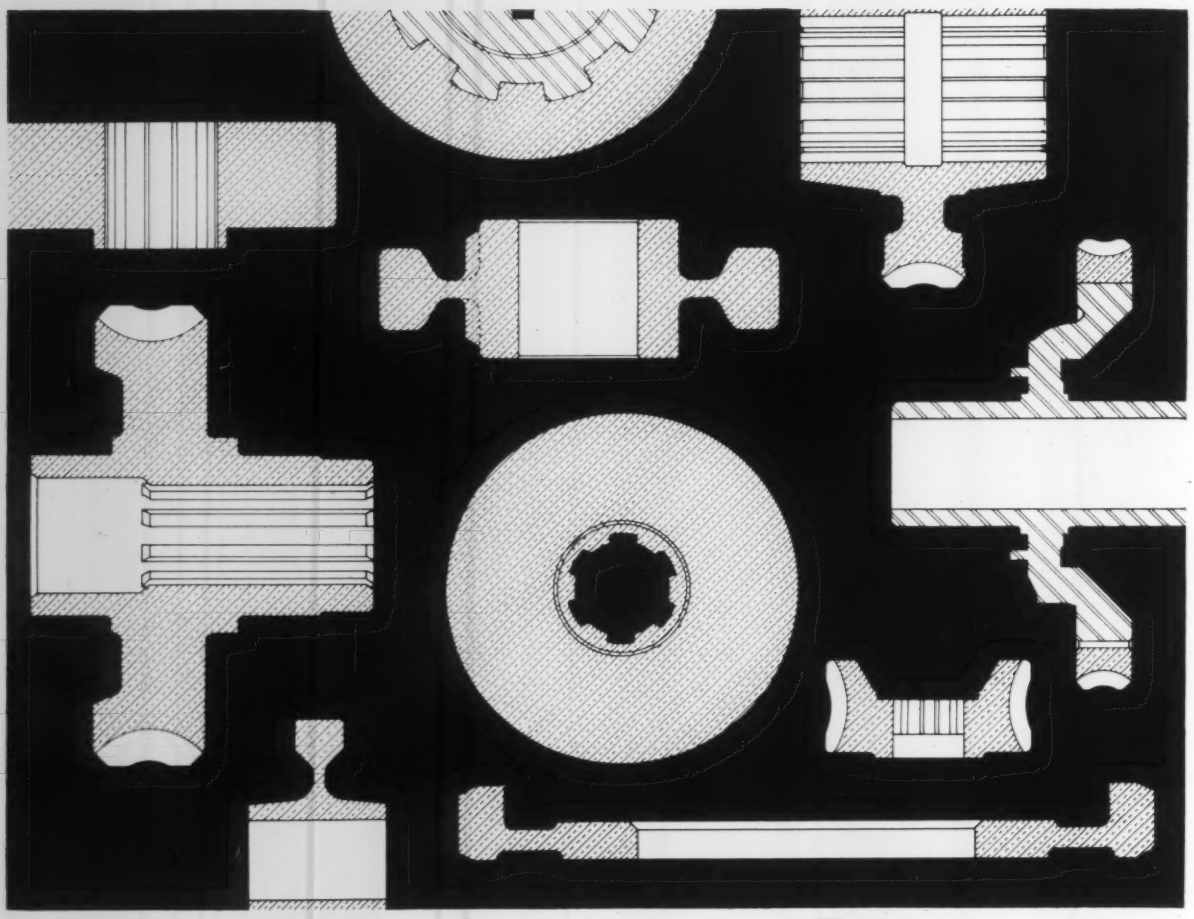
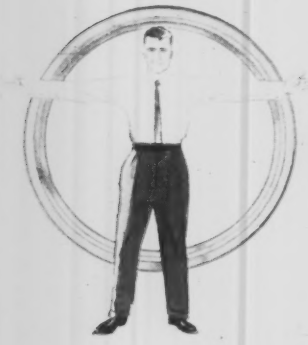


Gear Blanks . . . of any shape or size . . . we cast them in



Big gears are our specialty

Whatever the shape or size of the gear blank you need, NBD can cast it for you in gear bronze, nickel bronze, aluminum bronze, manganese bronze—to your specifications. Want iron or steel hubs cast in? We can do it. Want castings furnished rough, rough machined, or finished machined? Want sand castings, shell moldings, chilled rim or chilled three sides? You name it.

And we cast many blanks centrifugally . . . in sizes up to and even beyond 72″ in diameter. Centrifugally cast gears have proved their added strength, toughness and long-wearing characteristics for many problem applications. Perhaps they can do a job for you.

Got a metallurgical problem? NBD specializes in bronze metallurgy and casting techniques; has developed over 40 special alloys for gear blanks, bushings, bearings, pump components and other parts.

Take advantage of NBD's experience and knowledge of bronze alloys. Three strategically located plants are available to give you fast service. Call or write us for quotes or information.

AMERICAN Brake Shoe COMPANY

NATIONAL BEARING DIVISION

717 Grant Building, Pittsburgh 19, Pennsylvania

PLANTS IN: CHICAGO, ST. LOUIS, MEADVILLE, PA.

Press Is Fast, Has Manual or Semiautomatic Controls

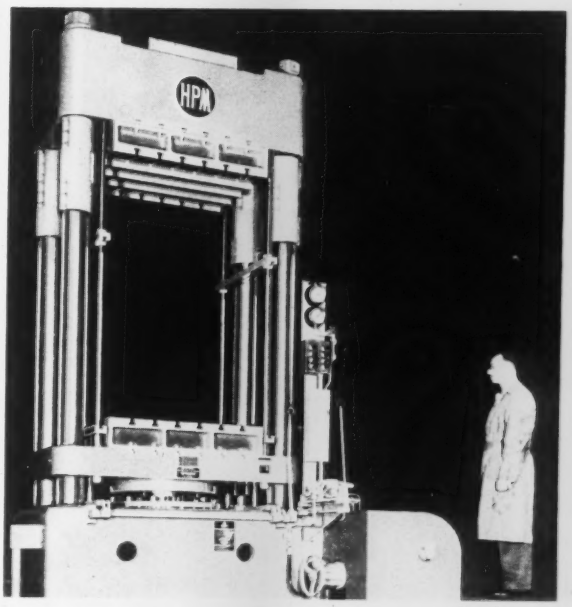
This upward acting, semiautomatic, compression molding press produces large parts, using thermosetting plastic materials. Capacity is 500 tons.

The ram assembly consists of a main ram and a booster ram working in the main hydraulic cylinder. The booster ram is securely fastened to the main ram cylinder. Axial oil passage in the booster ram permits high speed closing of the main ram.

The upper and lower mechanical ejectors are actuated by the return movement of the press platen. The upper ejector is manually reset by a convenient hand lever. Split nuts permit easy removal of knockout rods.

Hand switches and a synchronous multiflex timer provide both manual and semiautomatic control.

A 25-hp motor powers a radial piston hydraulic pump for press operations. Speed during the slow close part of the cycle can be adjusted quickly without affecting the speed of the rest of the cycle. Maximum mold space is 36 by 42 in; stroke, 36 in.; daylight opening, between platen and head, 85 in.; between grids, 69 in. Speeds: Closing, 315 ipm; pressing, 13.4 ipm; opening, 106 ipm. *Write*: Hydraulic Press Manufacturing Co. Div., Koehring Co., Mt. Gilead, Ohio.



Ultrasonic Gage Used for Automatic Production

Model R Vidigage is a self-contained installation for thickness gaging, recording, and detection of laminar flaws. It includes connections for automatic sorting and rejection. It is rack mounted, and consists of ultrasonic resonance gaging and indicating circuitry, a strip chart recorder, gating and alarm circuits, and calibration control.

The chassis holding the cathode ray tube and associated circuitry is removable for use in the field or on location.

Thickness of metals, glass, and plastics between 0.005 and 2.5 in. can be measured and wall thickness variation in tubing can be checked. The unit, with suitable attachments, can be set up to take corrective action automatically to keep parts within limits.

A highly magnified profile of surfaces being measured is shown on the chart. The recorder clearly shows changes that are barely visible on the screen.

The gating and alarm circuits trip a relay when a part reaches the dimensional limits, energizing audible or visual alarms, marking devices, or sorting attachments. Gating circuits may be added to sort materials into several thickness groups.

The unit weighs 225 lb, measures 21 by 24 by 68 in. high. *Write*: Branson Instruments Inc., 40 Brown House Rd., Stamford, Conn. *Phone*: Davis 4-6721

NEW PRODUCTS and equipment

E Z Lift

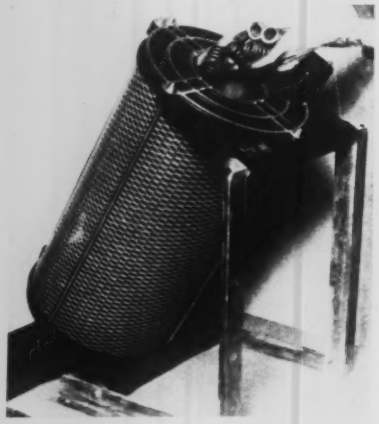
Loads may be raised by platform or pulled up from the floor 70 in. with the Model LTF-500 lift. A manually operated pump and valve actuate the unit. Weight is 240

lb, platform is 30 by 30 in., load center is 20 in., and lift capacity is 750 lb.

The unit is 80 in. high, 39 in. long, and 30 in. wide. *Write*: Crown Controls Co. Inc., New Bremen, Ohio.

Demagnetizer

Metal articles are demagnetized as they pass through this unit, which has a 6-in. tubular opening. It instantly removes metal dust and particles. Work falls through freely.

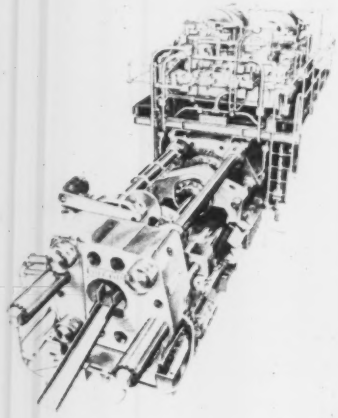


It may be mounted horizontally or at any desired angle.

Many sizes, lengths, and duty ratings are available. *Write*: R. B. Annis Co., 1101 N. Delaware St., Indianapolis 2, Ind. *Phone*: Melrose 5-2838

Extrusion Press

This 1500 to 1870 ton extrusion press operates up to 120 ipm. It is designed for brass and other copper alloy rods and shapes. Two 350-hp motors drive four Oilgear pumps, two of which are the DY type. Either or both sets may be used for operation.



The press is of the lateral die slide design, yet permits extruding with a shell. *Write*: Sutton Engineering Co., First National Bank Bldg., Pittsburgh 22, Pa. *Phone*: Grant 1-8077

Lathes

These general purpose lathes have capacities of 12¼ in. swing over bed, 12 in. swing over saddle wings, 8 in. over cross slide, and up

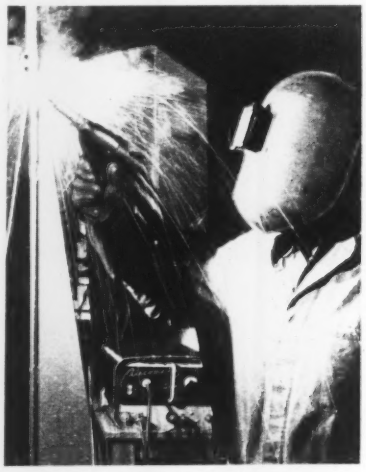
to 36 in. between centers.

Standard equipment includes 16 spindle speeds, V-belt drive, power feeds, and a wide feed and thread cutting range.

Speed range is 28 to 2072 rpm. *Write*: Atlas Press Co., 22195 N. Pritcher St., Kalamazoo, Mich. *Phone*: Fireside 5-7157

Arc Welding

This portable Airomatic welding assembly handles wire sizes from 0.020 in. hard to ⅛ in. aluminum. It is a manual unit for the inert gas, shielded arc welding processes.



Write: Air Reduction Sales Co. Div., Air Reduction Co. Inc., 150 E. 42nd St., New York 17, N. Y. *Phone*: Murray Hill 2-6700

Paint Stripping

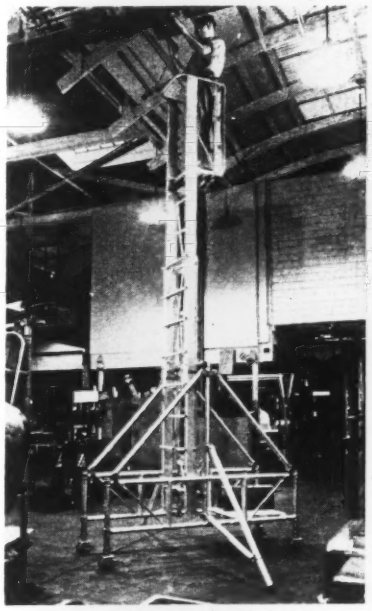
Kol-Strip solution strips modern organic finishes, including epons, modified epons, and acrylics. It is nonflammable.

Used at 260 to 275° F, it not only breaks the paint bond, but dissolves the resins and separates the pigments. *Write*: Kolene Corp., 12890 Westwood Ave., Detroit 23, Mich. *Phone*: Broadway 3-9220

Scaffolds

Overhead spot maintenance at heights of up to 30 ft can be done by one man with Tallescope. Easily and rapidly assembled by one man, the unit telescopes and folds down to roll through doorways and under equipment.

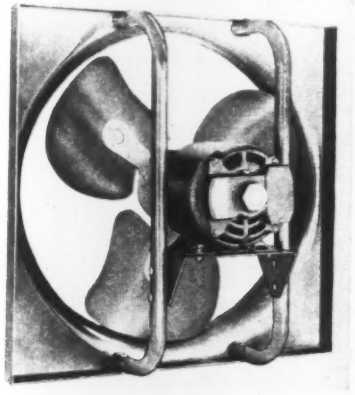
It separates easily into components for storage or transportation.



Write: Up-Right Scaffolds, 1013 Pardee, Berkeley, Calif. *Phone*: Thornwall 3-0770

Fans

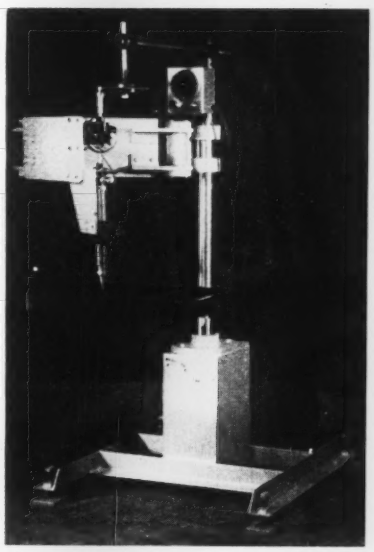
Models BA (industrial ventilating) and BG (utility exhaust) fans are light in weight and sturdy.



Write: Chelsea Fan & Blower Co., 639 South Ave., Plainfield, N. J. *Phone*: Market 3-0331

Steel Plate Cutter

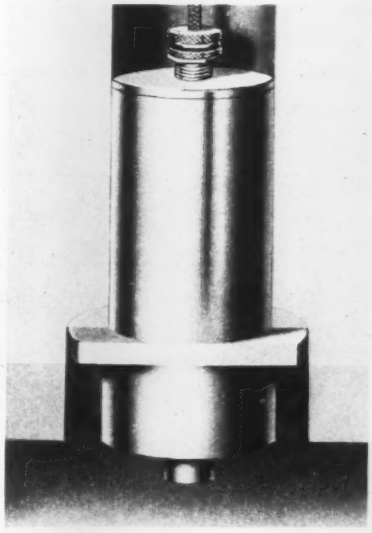
By use of templates, this machine can cut out irregular shaped machine or weldment parts from steel plates. The tracing head is driven by a variable speed gear motor.



Cutting speeds average 24 ipm on ¼-in. steel and 10 ipm on 2-in. steel. *Write*: Speedi-Burn Products Co., 534 Linden St., West Hempstead, N. Y.

Die-Mounted Magnet

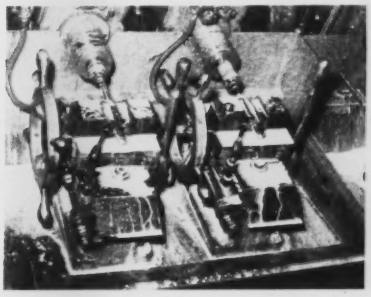
Automatic control and removal of ferrous metal scrap in stamping and shearing operations is handled by the Hold-Kick-Off magnet. When a die shears a part, the die-mounted magnet holds the scrap. At the proper instant, the scrap is knocked



into a receiving tray. Kickoff ratings on the four sizes of this product are from 27 to 250 lb. *Write*: Machine Tool Electric Corp., 706 Sheridan St., Lansing 4, Mich. *Phone*: Ivanhoe 9-9061

Horizontal Tapper

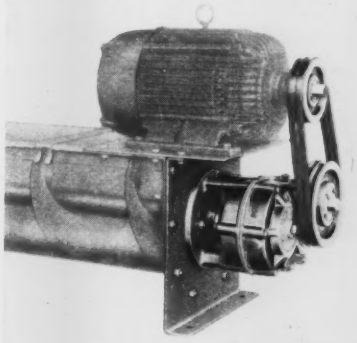
This two spindle, horizontal tapping machine has a reversing speed 150 per cent of the tapping speed. Tapping speeds are from 60 to 240 rpm.



Maximum tapping depth is 4 in. and reversal can be made in less than one revolution of the spindle. Write: Capco Products Div., Columbus Auto Parts Co., P. O. Box 507, Columbus 17, Ohio. *Phone*: Amherst 8-3581

Conveyor Drive

This screw conveyor drive is simple to mount and adjust on troughs. It consists of a speed reducer with packing gland and driveshaft. The packing gland is adjustable from the outside, uses



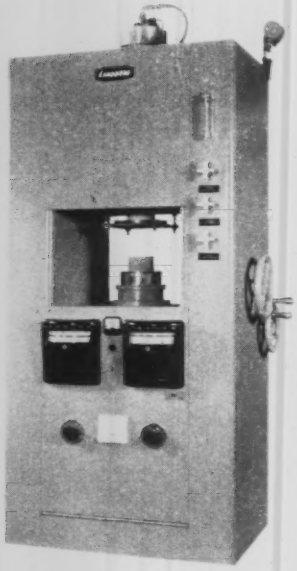
standard packing, and can be sight inspected. A flinger seal prevents contaminants from reaching the reducer seals.

Four sizes are offered with two ratios for each unit. *Write*: Dodge Mfg. Corp., Mishawaka, Ind. *Phone*: Blackburn 9-2421

Atmosphere Furnace

This new high temperature, vertical tube atmosphere furnace is ideal for numerous pilot plant and

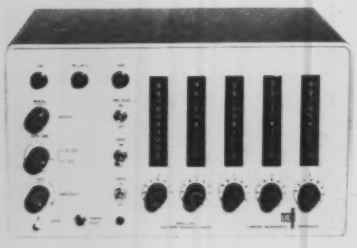
NEW PRODUCTS and equipment



laboratory applications. It furnishes protective atmosphere, cooking chamber, and accurate temperature control up to 2750° F. *Write*: Pilot Plant Div., Lindberg Engineering Co., 2444 W. Hubbard St., Chicago 12, Ill. *Phone*: Monroe 6-3443

Electronic Gage

Model 620A is a gage for speed and rate control. As a material flow controller, this device can be used in a steel mill to prevent line buckle and stretch-out.



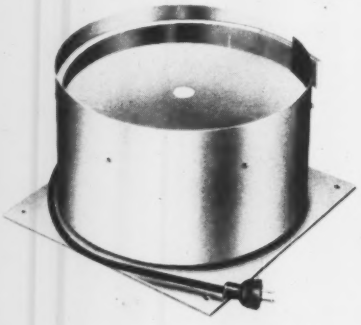
It works well as a pressure or liquid flow regulating system. *Write*: Computer-Measurements Corp., 5528 Vineland Ave., North Hollywood, Calif. *Phone*: Poplar 3-0566

Discharge Pump

Model 5P-4521 (sealless) is a triple discharge pump. Discharges may be used individually, simultaneously, or in any combination. The pump handles coolants or liquids containing grit or abrasives for heads up to 30 ft and capacities up to 30 gpm. *Write*: Ruthman Machinery Co., Cincinnati 2, Ohio. *Phone*: Main 1-5462

Part Feeder

These feeders are engineered to handle specific parts. They are integrated bowls fixed to electromagnetic power drives.



No separate controls are necessary. *Write*: Burklyn Co., 3429 Glendale Blvd., Los Angeles 39, Calif. *Phone*: Normandy 2-3111

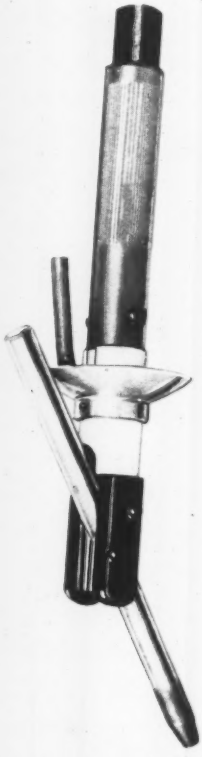
Quality Measurements

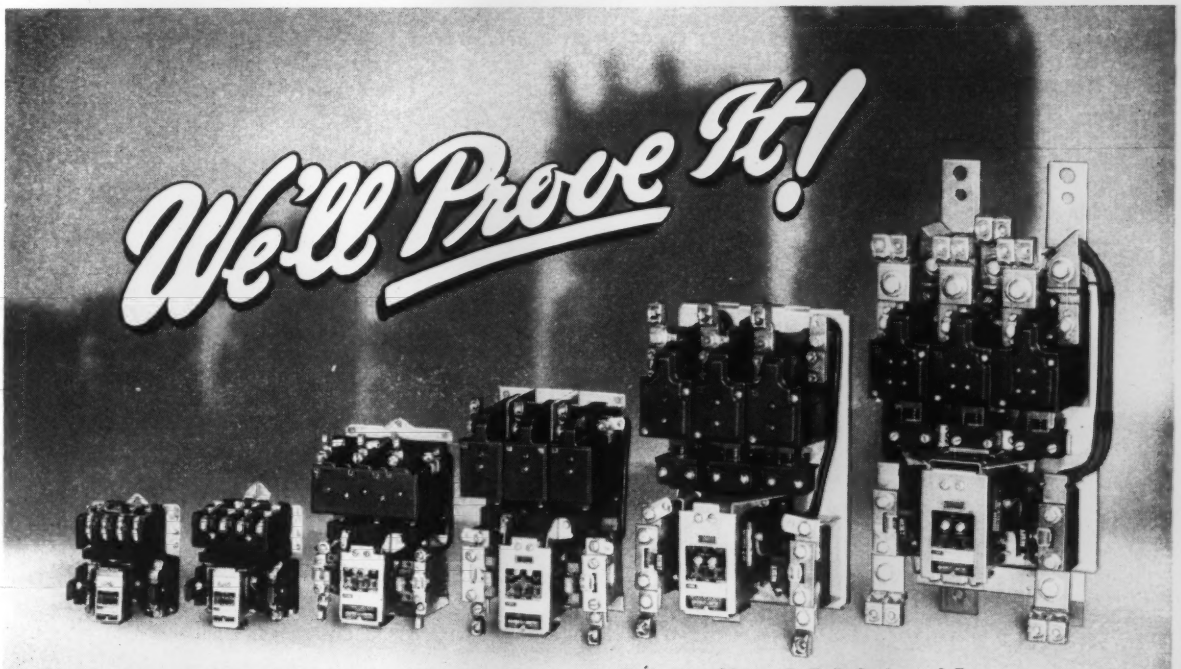
Glennit Laminagage, Model FLW-1, measures thickness of metallic film or foil and will detect surface and subsurface cracks in

smooth or rough coatings, flat stock, or tubing. It measures coating thickness from 0.00005 to 0.007 in. with an accuracy of 10 per cent. *Write*: Gulton Industries, 212 Durham Ave., Metuchen, N. J. *Phone*: Liberty 8-2800

Torches

Featuring high current capacity, pushbutton air control, and operator shields, two new models of Arc-air torches can be used for intricate contouring or large volume metal





Square D Vertical Action Magnetic Starters Sizes 0, 1, 2, 3, 4 and 5

ONLY SQUARE D GIVES YOU ALL 5

1 *QUICK* INSTALLATION!

No groping or fumbling. Square D gives you lots of wiring space, plenty of knockouts, handy and clearly marked pressure wire connectors.

2 *TOP* PERFORMANCE!

No needless downtime from coil burnout, mechanical binding, contact freezing. Square D gives you an extra-capacity magnet with a tough and cool-operating encapsulated coil to handle additional poles and interlocks—a guided single moving part—big silver cadmium-oxide contacts with strong finger springs—arcing yokes on larger sizes.

3 *REAL* OVERLOAD PROTECTION!

No change in trip characteristics because of mismatched parts supplied separately for field assembly, no distortion of heater in installation. Square D gives you melting alloy unit construction—factory-assembled and individually tested for bull's-eye accuracy. Also bi-metal and magnetic designs for automatic reset or adjustable trip applications.

4 *EASY* INSPECTION and MAINTENANCE!

No starter is "maintenance-free." But Square D makes the job easy. Inspection is a breeze. You don't have to remove wiring for contact replacement or take the starter out of the enclosure to change coils.

5 *WIDE-RANGE* ADAPTABILITY!

No need for excessive inventories to avoid costly waiting for non-standard arrangements. Square D provides "off-the-shelf" kits for changing contacts and coils, adding pushbuttons, selector switches, and up to 4 double-throw auxiliary circuits.

Send for the COMPLETE Story!

Square D Company, Dept. 17
4041 North Richards Street, Milwaukee 12, Wisconsin

Please send me your new bulletin with detailed proof that Square D offers me my best starter investment.

Name_____

Company_____

Address_____

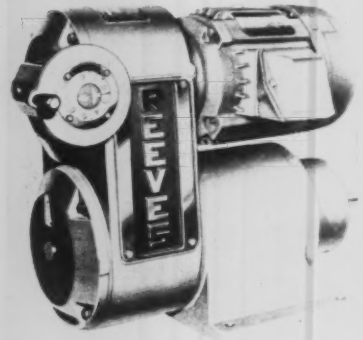
City_____ Zone____ State_____

SQUARE D COMPANY

removal. They can help foundry users solve problems of riser stub and flash removal. These torches work on all metals. One of them is designed for heavy duty foundry operations such as pad washing. *Write*: Arcair Co., P.O. Box 431, Lancaster, Ohio. *Phone*: Olive 3-5618

Gear Reducer

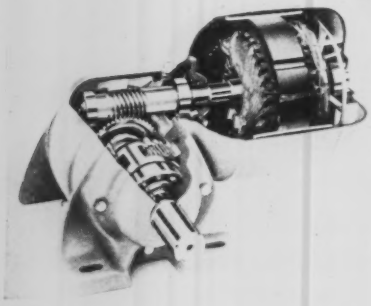
Motodrive resists most acids, gases, and corrosive dusts. Cap screws have hex heads and are zinc coated against corrosion to insure easy disassembly. Corrosionproof cast iron



is used throughout. The unit has a variable speed control covering a wide range. *Write*: Reeves Pulley Co. Div., Reliance Electric & Engineering Co., Columbus, Ind. *Phone*: Glenville 1-3530

Gear Motor

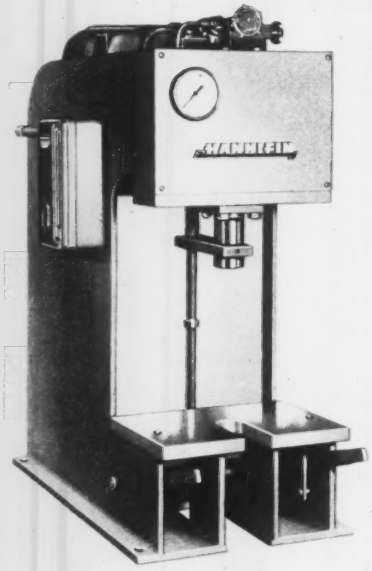
These combination, single planetary, gear motors have ratings of 1/4 to 1 hp and speed ranges of 3 through 38 rpm. In some speeds and ratios these units are more efficient than single reduction gear motors.



Units are compact and light in weight. *Write*: Electra Motors, Inc., 1110 Lemon St., Anaheim, Calif. *Phone*: Keystone 5-6061

High Speed Bench Press

Small diecasting shops can use this 4-ton press. Reach and stroke are 6 in. Standard operations are forming, trimming, and force-fitting.



Tonnage is adjustable from 10 per cent to full capacity. *Write*: Machinery Div., Hannifin Co., Des Plaines, Ill.

Sheet Lifter

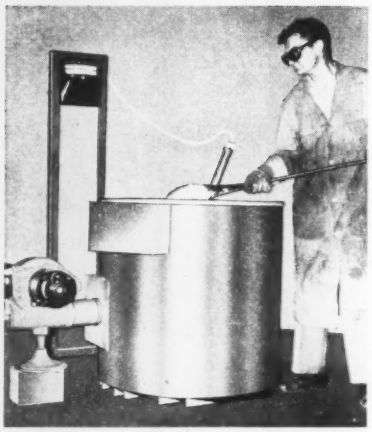
No. 12651 is a heavy duty (1-ton capacity) vacuum lift. It has four cups and a self-contained power tilt. Power and control units are built into a crane mounting housing.

Vacuum tank with safety lights is featured. *Write*: Vac-u-mation Div., F. J. Littell Machine Co., Dept. 4-D, 4555 N. Ravenswood Ave., Chicago 40, Ill. *Phone*: Ravenswood 8-3322

Portable Furnace

The Nocoste furnace has an all-steel shell with a Kast-O-Lite lining which stores no heat and does away with coasting over.

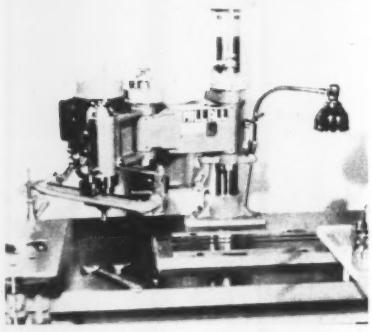
No outside flue is necessary. Capacity is 150 to 300 lb. It furnishes a continuous supply of metal at the correct pouring temperature. *Write*:



Industrial Scale & Equipment Co., P. O. Box 3114, Bridgeport 5, Conn. *Phone*: Edison 4-5185

Does Many Jobs

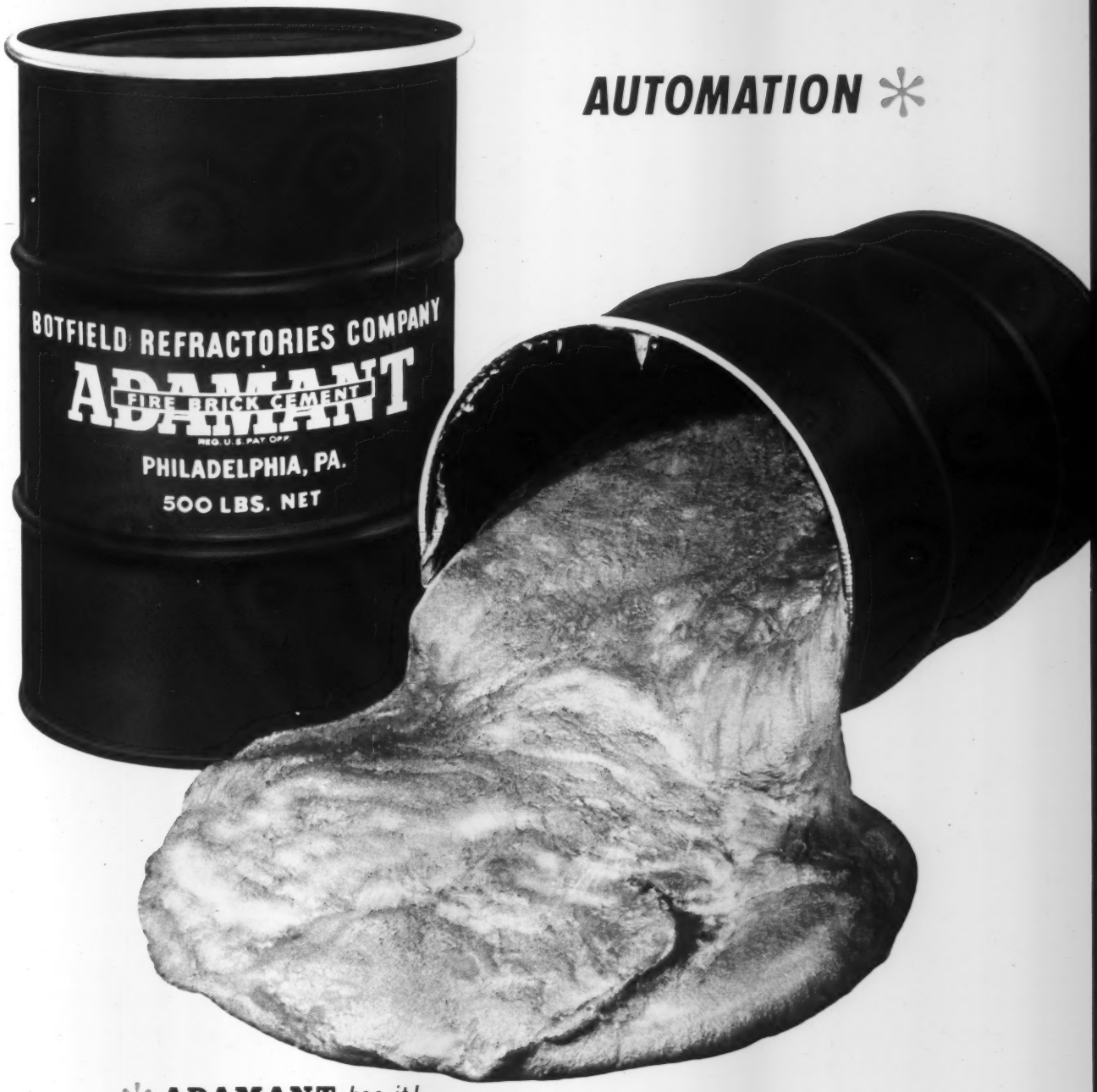
This pantograph controlled machine works on metal, plastics, and wood. It is designed to fill the gap between two-dimensional engraving machines and duplicating machines. The unit mills, routs, drills, spot-faces, grinds, slots, laps, engraves, and does index milling on metal or plastics. A 1/3-hp motor provides speeds from 500 to 6000



rpm in six stages. It has a 22-in. reach from the column, 18-in. swing, and 9½-in. clearance under the cutter. Tolerances of plus or minus 0.0005 are claimed with a properly made master. *Write*: Mill All, 8 E. Prospect Ave., Mount Vernon, N. Y.

Coolant Unit

Installation of this unit permits the use of gun drills on turning machines for deep, precision drilling in one pass at a high rate of feed. The unit delivers 40 to 60 gpm of coolant at the drill head. It has three-stage filtration, using 40 micron filters,



AUTOMATION *

* **ADAMANT** *has it!*

. . . "*automation*" can be had in laying firebrick, too . . . when a firebrick mechanic is able to lay brick after brick, course after course . . . with a cement that remains plastic and smooth with each trowel-full.

Write for Bonding Mortars Bulletin #3 . . . Yellow Pages of 'phone directory have your nearest 'ADAMANT' Distributor.

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facts about LEDLOY* FREE-MACHINING STEELS

Inland's Special Ledloy Screw-machining Steels Outperform B1113 and in Certain Cases Brass*

There are two grades of Inland Ledloy Steels that have been developed specifically for automatic screw-machine operations, Ledloy Grade A and Ledloy Grade B.

Ledloy Grade A, the most widely used leaded steel grade, machines from 25% to 55% faster than regular free-machining steels and yet retains all the desirable characteristics. Ledloy Grade A contains .15/.35% lead—uniformly dispersed through the steel so that it has no appreciable effect on the steel except to increase its machinability to a marked degree. Ledloy Grade A retains all the properties of open hearth free-machining steel of comparable base analysis.

Whatever you have been machining from regular free-machining steels you can machine from Inland Ledloy Grade A and increase your machining time up to 55%, and at the same time, obtain a superior surface.

The place of Inland Ledloy Grade A has been so firmly established in the screw-machining industry that the A.I.S.I. and S.A.E. have adopted a new grade designation tailored to its specifications. *The new standard grade designation is* C12L14.

Inland Ledloy Grade B, the fastest machining steel produced commercially today, was developed by Inland to replace brass in the manufacture of parts where machinability is the all-important factor. Ledloy Grade B provides much greater strength than brass, yields more parts per pound and yet machines from 80 to 90% as fast as the more costly free-machining brass grades.

Ledloy Grade B, like Grade A, is an open hearth steel with all the desirable open hearth steel qualities. It is rephosphorized, resulphurized and lead treated. The only difference between the two grades is that Grade B contains a higher sulphur content. This additional sulphur increases the machinability of Grade B over Grade A about 25%.

In deciding which grade of Inland Ledloy is best for a particular part you are machining, weigh carefully the following factors: amount of machining to be done on part, type of machining, machining time per cycle, strength required in finished part and cost of material.

Where average machining is called for, you will probably find Ledloy Grade A the most practical. Where more machining operations per part are required, or where the machining is more intricate, Grade B will probably be more satisfactory. The additional cost of Grade B can be more than made up in decreased machining costs.

Whichever grade of Inland Ledloy is best for your particular machining operation, you will find that Ledloy will provide fast machining and excellent finish for the parts you make. Ledloy, because of its lower friction component and inherent lubricating characteristics, will also greatly increase the life of your cutting tools.

Many grades available—Inland Ledloy free-machining steels are available in a wide range of standard carbon and alloy grades in bar form. Ledloy free-machining plates are also produced.

If your product requires machining, it will pay you to get all the details on Inland Ledloy . . . the original leaded steels. Ask your cold-drawer about them today, or write Inland Steel Company, 30 West Monroe Street, Chicago 3, Illinois, for the interesting booklet, "Properties of Inland Ledloy Steels."

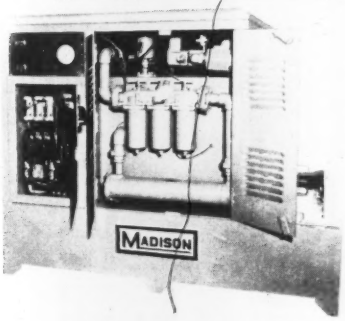
INLAND STEEL

Sales Offices: Chicago · Milwaukee · St. Paul · Davenport
St. Louis · Kansas City · Indianapolis · Detroit · New York

INLAND

Ledloy Steels
the world's most machinable
*Reg. Trade Mark

NEW PRODUCTS and equipment



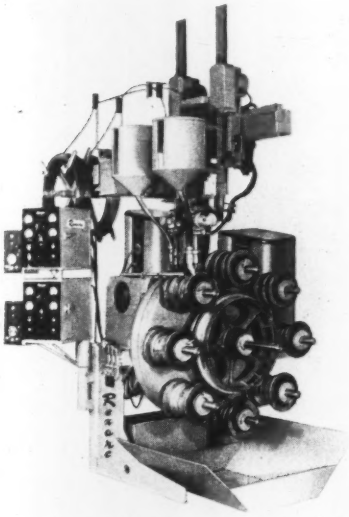
and a heat exchanger with water regulator.

It is powered by totally enclosed motors conforming to all JIC standards.

Pressure is adjustable from zero to 750 psi. *Write:* Madison Industries Inc., Muskegon, Mich. *Phone:* 2-8886

Automatic Welder

This new welding machine, Rex-arc MS-8, builds up both sides of worn tractor rollers simultaneously. It is capable of handling eight tractor rollers and one idler at a time. By the time the first roller hard-faced reaches the eighth position, it



is sufficiently cooled to receive the second welding pass. Only one spindle turns at a time, and rotates only when in the welding position. A few seconds are required to rotate the turret from one welding position to the next. Welding heads are not moved out of position for indexing operations.

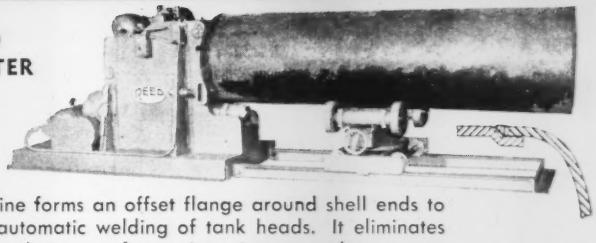
The twin welding heads work simultaneously or independently. They are power operated vertically and horizontally by controls. The turret index and tilting of the positioner also are similarly power operated. An automatic stepover moves each welding head with each weldment revolution to give a smooth surface to the work.

A 120-degree tilting table enables positioning of both center mandrel and outer spindles from 30 degrees below horizontal to any position up to and including the vertical, so that rebuilding of roller flanges also is done automatically.

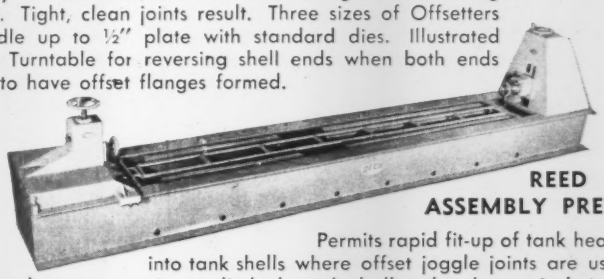
The unit can hard-face or weld on idlers up to 38 in. in diameter without removing any of the spindles, and round weldments up to 46 in. in diameter can be handled by doing so. *Write:* Sight Feed Generator Co., West Alexandria, Ohio.

WEBB TANK PRODUCTION MACHINERY

REED OFFSETTER



This machine forms an offset flange around shell ends to facilitate automatic welding of tank heads. It eliminates chill rings, decreases fit-up time, improves the concentricity of shell ends, and aids in reducing actual welding time. Tight, clean joints result. Three sizes of Offsetters handle up to ½" plate with standard dies. Illustrated with Turntable for reversing shell ends when both ends are to have offset flanges formed.



REED ASSEMBLY PRESS

Permits rapid fit-up of tank heads into tank shells where offset joggle joints are used. Hydraulic pressure is applied through ball-and-socket swivel joints that allow the head cups to set to the head. Hydraulically powered kick-outs speed up loading and unloading. Both headstock and tailstock are adjustable vertically; tailstock is also adjustable along the bed for various lengths of vessels up to 18'.

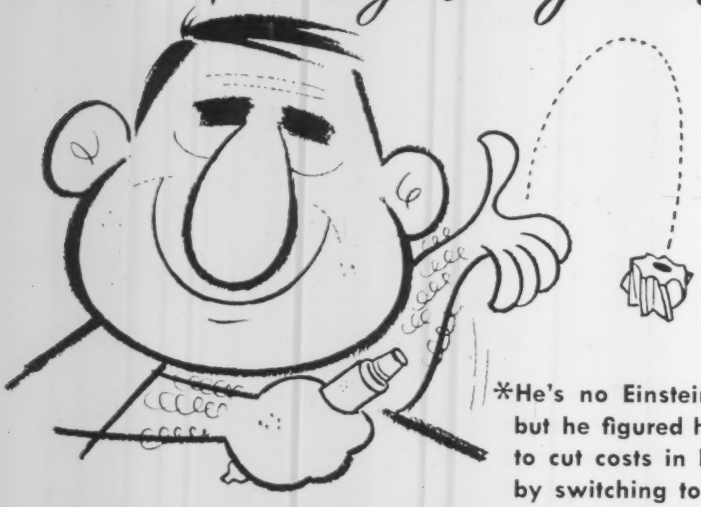
Fit-up rolls are also available to facilitate proper alignment and assembly of shells lacking rigidity.

Horn Type Fixtures | Cylinder Flange Offsetters | Assembly Fixtures | Unit Type Turning Rolls | Portable Turning Rolls | Automatic Welding Track Supports

See Our Booth #809—AWS Welding Show—St. Louis, Mo.

REED EQUIPMENT DIVISION
THE WEBB CORP. WEBB CITY, MO. U. S. A.

*Now they call Joe a genius**

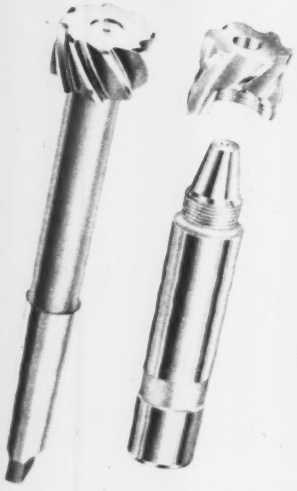


*He's no Einstein— but he figured how to cut costs in half by switching to . . .

NEW T-J REAMERS
with *throw-away heads!*

You don't have to be a wizard at figures to see how the new T-J Reamer with Throw-Away Head cuts your replacement costs to *less than half*. You *save* because you replace *only* the part that wears out. Buy original shank . . . change the head in a jiffy when worn. Wide range of head sizes from ½" to 2¾" inclusive, in 1/16" increments available with right or left hand spiral flutes for thru or blind hole reaming.

Tapered hole in head insures concentricity and *new* thread design assures a snug fit on smoothly ground tapered shank. Reamer operates free from binding or sticking due to cutting portion wearing undersize and creating negative relief. It's a product of T-J's 39 years of know-how as one of the largest manufacturers of die sinking milling cutters. Tomkins-Johnson Co., 617 North Mechanic St., Jackson, Mich.



Left hand spiral, right hand cut. Right hand spiral, right hand cut.

1—Cuts replacement cost to less than half!
2—Quick change of heads saves time.
3—Easy to change heads for different metals, increases efficiency.
4—Head and arbor firmly locked together.
5—Wide range of sizes.

★Exclusive, high potential territories open to responsible manufacturers representatives. Write today!

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DIVITORS...AIR AND HYDRAULIC CYLINDERS...CUTTERS...CLINCHORS

SEE US AT BOOTH 1423
A. S. T. E. SHOW

NEW Literature

Write directly to the company for a copy

Thread Rolling

The advantages of rolling threads from the end with self-opening heads are set forth in Catalog NAF-57A. National Acme Co., 170 E. 131st St., Cleveland 8, Ohio.

Testing

Expansion of testing facilities in both size and scope is described in this brochure. New York Testing Laboratories Inc., 47-48 West St., New York 6, N. Y.

Milling Spindles

Models to 50 hp and specials above that are described in Catalog RT-58. They are hydraulically driven and feature a constant horsepower over a variable speed range. Romulus Tool & Engineering Co., 13581 Huron River Dr., Romulus, Mich.

Presses

This bulletin describes the MS2, two point, straight side, double geared presses ranging in capacity from 150 to 500 tons. Minster Machine Co., Minster, Ohio.

Rust Preventative

Chart No. 158 lists military specifications and conforming Nox-Rust products. Properties and applications are given. Daubert Chemical Co., Chicago 1, Ill.

Arc Welding

Instruction Manual IM-131-C has been prepared for Shield Arc Junior and Aircraft welders. Lincoln Electric Co., Cleveland 17, Ohio.

Aluminum Chart

Sec. G, No. 1, file size, covers government aluminum specifications and helpful information on bending and forming sheets and plates. Typical values for elongation and shear, yield, and ultimate tensile strength are included. Peter A. Frasse & Co. Inc., 17 Grand St., New York 13, N. Y.

Pneumatic Gages

A brochure describes manual and automatic gaging and related equipment. Moore Products Co., Philadelphia 24, Pa.

Blowers

Performance characteristics and dimensions of blower units are described in a 6-page bulletin. Air Impeller Div., Torrington Mfg. Co., Torrington, Conn.

Numerical Control

Tape and card control of this company's jig borers and grinders is covered in this bulletin. Fosdick Machine Tool Co., Cincinnati 23, Ohio.

Safety Equipment

Product description of safety equipment components is included in No. 57, a

NEW LITERATURE . . .

66-page catalog prepared by Willson Products Div., Ray-O-Vac Co., 212 E. Washington Ave., Madison, Wis.

Air Pollution

Bulletin L-2 details specifications, operations, and advantages of this line of hot gas washers. Lehigh Fan & Blower Div., Fuller Co., Catasauqua, Pa.

Packaging

"How To Specify Corrugated Boxes" covers redesign of your present packaging. Shipping methods, rules, and regulation information are included. Hinde & Dauch, Sandusky, Ohio.

Bearings

Precision ball bearings from ½ down to 1/10 in. in diameter are described in this bulletin. Standard bearings and special applications, load ratings, limiting speeds, mounting procedures, and torque conversion charts are included. Miniature Precision Bearings, Inc., Precision Park, Keene, N. H.

Pocket Selector

This free plastic slide rule enables you to select Acme or ASA standard bushings without a catalog. It gives sizes for over 30,000 drill bushings, designates OD and ID of liners in decimals, shows head sizes of shoulder types, and indicates lock screws for slip fit bushings. Acme Industrial Co., 200-222 N. Laflin St., Chicago 7, Ill.

Electrode Selector Guide

Bulletin AR 20-26 helps in selection of electrodes and gives current ranges for various materials. Alloy Rod Co., P.O. Box 1828, York, Pa.

Metal Treating

"A Guide to Chemical Treatments of Metals" describes various chemical conversion coatings for corrosion resistance, paint bonding, drawing and forming, and protection for friction surfaces. Chemical Paint Co., Ambler 1, Pa.

Ventilating Units

Bulletin UVS-104 covers belt-driven units. Performance and engineering data are given along with installation information. General Blower Co., Morton Grove, Ill.

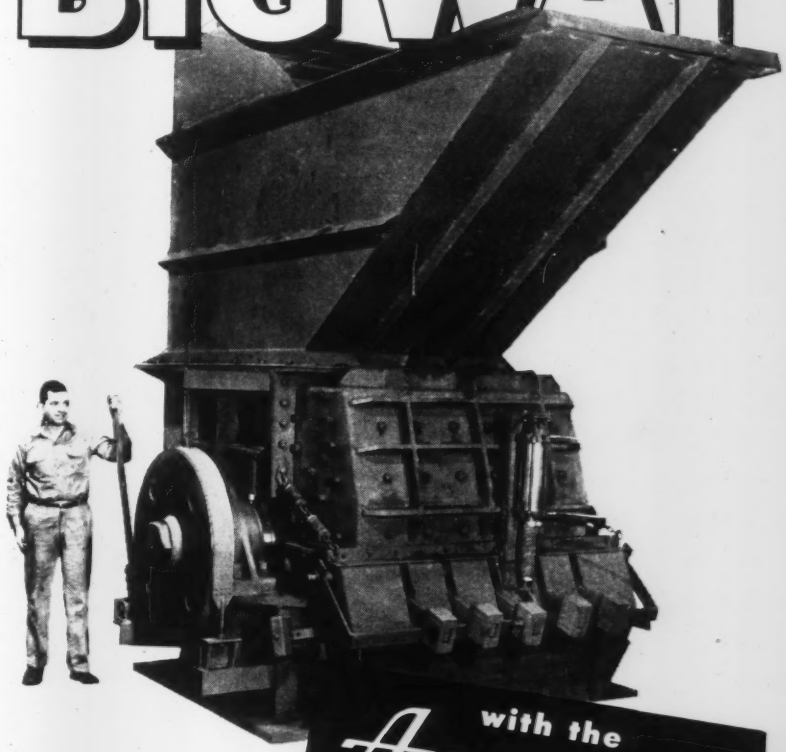
Rubberized Abrasives

This catalog contains application information and tables. Cratex Mfg. Co., 1600 Rollins Rd., Burlingame, Calif.

Coil Stock

Catalog 57 pictures modern equipment for handling, reeling, straightening, and feeding coil stock and winding scrap. Catalog Dept., F. J. Littell Machine Co., 4101 N. Ravenswood Ave., Chicago 13, Ill.

metal turnings reduction... in a BIG WAY



with the American ROLLING RING Metal Turnings Crusher

Especially Designed for . . .

- Metal Scrap Yards
- Large Industrial Plants
- Aluminum Smelters

. . . Designed for clam shell bucket or magnet feed. Large capacities: 25 to 50 tons per hour.

. . . Built to handle the Primary Reduction of:
. Metal Turnings
. Aluminum Alloy Castings (Crankcases, Pistons, Beer Barrels, Pots and Pans, etc.)

. . . Uses the Exclusive American Rolling Shredder Ring Crushing Principle.

OTHER MODELS with capacities from 1 to 10 TPH
WRITE for illustrated literature

American PULVERIZER COMPANY
Originators and Manufacturers of Ring Crushers and Pulverizers
1539 Macklind Ave.
St. Louis 10, Mo.

RESTRICTED SPECIFICATION COLD ROLLED STRIP STEEL

J&L THE 4 IN 1 SOURCE

Four plants with facilities in Youngstown, Indianapolis, Los Angeles and Kenilworth, N. J., for the production of restricted specification cold rolled strip steel. J&L Strip Steel Division Products: Low Carbon, High Carbon, Annealed or Hardened and Tempered Spring Steel, Electro Galvanized or Hot Dipped Continuous Galvanized, Tin Coated, Alloy, Stainless.

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STEEL CORPORATION
STRIP STEEL DIVISION
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PLANTS: YOUNGSTOWN • INDIANAPOLIS • LOS ANGELES • KENILWORTH, NEW JERSEY
SALES OFFICES: NEW YORK • ROCHESTER • NEWINGTON, CONN. • YOUNGSTOWN • CLEVELAND
DETROIT • INDIANAPOLIS • CHICAGO • LOS ANGELES • SAN FRANCISCO
FORMERLY THE COLD METAL PRODUCTS COMPANY

STEEL
March 10, 1958

Market Outlook

STEELMAKERS are still looking for the first clear indications of a business upturn. So far as March is concerned, improvement doesn't seem to be in the cards.

CUTBACKS CONTINUE— For one thing, automakers are still turning out more cars than they're selling. As a result, they must curtail production. Ford Motor Co. will operate on reduced schedules for several weeks. Chevrolet, one of the strongest producers until now, also plans cutbacks. It already has canceled about half its April steel orders.

WINTER LINGERS— As car builders push March orders into April, cold weather hinders construction. There has been no pickup in demand for plates or structurals. Nor have the heating and plumbing industries increased their purchases of buttweld pipe. The seasonal upturns for these products, as well as for merchant wire, may come a month late.

FIRST QUARTER LOWEST?— In a letter to stockholders, Chairman J. L. Mauthe and President A. S. Glossbrenner of Youngstown Sheet & Tube Co. declare: "The steel industry's first quarter may be the low one this year, barring strikes or other interruptions to major steel consuming industries. How long it may be before we return to normal volume is a matter of considerable conjecture."

FURNACES REACTIVATED— Responding to a modest improvement in orders, Youngstown reactivated two open hearth furnaces on Mar. 1. Last week, Wheeling Steel Corp. followed suit, bringing three blast furnaces and its Bessemer Dept. back into production at Mingo Junction, Ohio. They were idle in February. Today, Wheeling will reactivate two additional open hearths at Steubenville, Ohio.

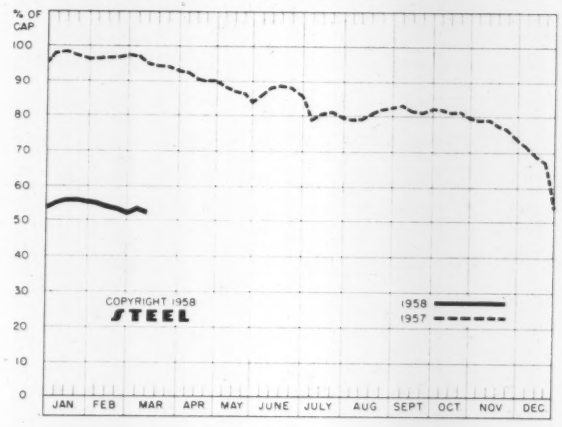
PRODUCTION SLIPS— While some steelmakers were increasing their output, others were cutting back. In Detroit, Jones & Laughlin Steel Corp. suspended operations. On a national basis, the steelmaking rate dropped 1 point to 52.5 per cent of capacity. Production was about 1,417,500 net tons of steel for ingots and castings, vs. 2,411,000 tons a year ago.

SHEETS LOW— Of the stocks of major steel products held in consuming plants, sheet inventories are the lightest. For several months, consumers have been fabricating substantially more tonnage than they've been buying. They buy only for spot needs and seldom have to wait more than two to three weeks for delivery.

BARS STABILIZED?— "The downward trend in bars has been stopped," a manager of hot-rolled bar sales asserts. He sees no signs of an immediate upturn, admits that he's filling orders for some bars in as little as a week's leadtime. A producer of cold-drawn bars says demand for his product is dull. "We usually look for a sales spurt on the first of March," he explains, "but there are too many unsold cars for the automotive industry to show much more strength."

BRIGHT SPOTS— Production of tin plate continues at a near-capacity level. Galvanized sheets are in good demand, with large quantities being used for ductwork in the air conditioning of office buildings.

NATIONAL STEELWORKS OPERATIONS



DISTRICT INGOT RATES

(Percentage of Capacity Engaged)

	Week Ended Mar. 9	Change	Same Week 1957	Same Week 1956
Pittsburgh	56	— 2.5*	97.5	102.5
Chicago	58.5	— 1*	94.5	100.5
Mid-Atlantic	64	— 3	99.5	100
Youngstown	53	— 2	94	97
Wheeling	64.5	+ 5.5	97	96.5
Cleveland	34.5	— 0.5*	90.5	103.5
Buffalo	36.5	— 2.5	100	105
Birmingham	51.5	0	95.5	96
New England	52	0	67	75
Cincinnati	29	—22.5	83.5	97.5
St. Louis	79	— 3.5	95.5	106
Detroit	46	— 3.5*	100.5	100.5
Western	69	+ 1	104	104
National Rate	52.5	— 1	95	99

INGOT PRODUCTION‡

	Week Ended Mar. 9	Week Ago	Month Ago	Year Ago
INDEX (1947-49=100)	88.3†	91.8	90.7	150.1
NET TONS (In thousands)	1,419†	1,475	1,457	2,411

*Change from preceding week's revised rate. †Estimated. ‡American Iron & Steel Institute. Weekly capacity (net tons): 2,699,173 in 1958; 2,559,490 in 1957; 2,461,893 in 1956.

Metalworking Outlook—Page 73 Technical Outlook—Page 121

5 Groups Buy More Steel, 16 Buy Less

FIVE market outlets for mill shipments of finished steel took more tonnage in 1957 than they did in 1956. The gains were made despite a decline in total shipments.

Percentage increases of the markets that grew are: Construction and maintenance, 19.94; automotive, 0.60; shipbuilding and marine equipment, 68.06; agricultural, 1.45; and exports, 26.13.

The other 16 markets in the yearly summary compiled by American Iron & Steel Institute decreased.

Total shipments from mills were down 4.03 per cent. Alloy steel shipments (excluding stainless and heat resisting) took the biggest tumble. They fell 14.67 per cent below 1956 marks. Stainless and heat resisting steel dropped 9.88 per cent, while carbon steel shipments eased off only 3.21 per cent.

The construction and maintenance industry showed the biggest tonnage increase. Its take of 12,523,285 net tons was 2,082,159 tons over its 1956 figure.

Construction and maintenance continued to be the third largest outlet for mill shipments of steel. No. 1 was the warehouse industry (jobbers, dealers, distributors), with 14,507,308 tons. Second was the auto industry—14,227,096 tons.

• *An extra copy of this article is available until supply is exhausted. Write Editorial Service,* STEEL, *Penton Bldg., Cleveland 13, Ohio.*

Distribution of Finished Steel in 1957 by Market Classification

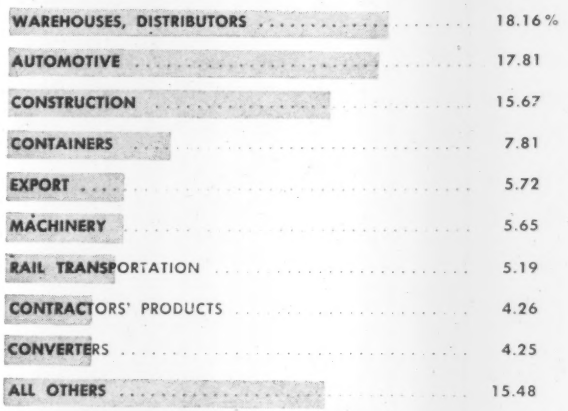
Net tons of mill shipments of all grades, including carbon, alloy, stainless, and heat resisting steel

Market Classification	Ingots, Blooms, Billets, Slabs, Sheet Bars, & Seamless Tube Rounds	Skelp	Wire Rods	Structural Shapes (heavy)	Steel Piling	Plates	Standard Rails (over 60 lb)	Rails (all other)	Joint Bars	Tie Plates
Converters, Processors	618,887	73,577	306,998	1,411	.....	205,000	.....	41	1,090	15
Forgings (except automotive)	651,866	.....	52	.....	.....	20,176	.....	.....	.....	.....
Bolts, Nuts, Rivets, Screws	43,604	.....	248,467	.....	.....	893	.....	.....	.....	.....
Jobbers, Dealers, Distributors	58,435	670	69,412	1,390,020	47,044	1,382,800	9,325	23,500	2,286	651
Construction, Maintenance	117,768	4	34,326	3,705,704	450,757	2,375,120	49,061	16,981	2,667	5,075
Contractors' Products	2,213	.....	39,349	35,926	.....	237,580	.....	.....	.....	.....
Automotive	471,253	.....	58,882	47,956	.....	353,845	61	.....	.....	.....
Rail Transportation	63,619	.....	550	572,689	754	1,046,433	948,596	14,303	63,526	207,324
Shipbuilding, Marine Equip.	20,864	.....	.....	201,185	3,974	913,938	2,491	455	7	.....
Aircraft	15,810	.....	45	5,047	.....	10,513	.....	.....	.....	.....
Oil & Gas Drilling	36,189	.....	25	51,711	173	37,632	.....	.....	.....	.....
Mining, Quarrying, Lumbering	4,735	.....	6	35,291	940	80,679	15,517	15,979	1,309	2,263
Agricultural	12,779	.....	9,420	48,166	.....	99,390	.....	.....	.....	.....
Machinery, Indust. Equip., Tools	153,654	.....	133,257	286,134	.....	1,475,977	3,728	6,216	311	185
Electrical Machinery & Equip.	1,653	.....	19,497	41,188	.....	222,810	.....	.....	.....	.....
Appliances, Utensils, Cutlery	.....	.....	820	3,980	.....	11,412	.....	.....	.....	.....
Other Domestic, Commercial Equip.	4,111	.....	23,785	7,732	.....	24,508	.....	.....	.....	.....
Containers	5,578	.....	978	1,349	.....	26,864	.....	.....	.....	.....
Ordnance & Other Military	125,516	.....	683	6,449	298	95,878	1,031	.....	73	337
Export	415,361	78,698	14,057	375,553	65,733	618,829	164,595	8,968	7,711	15,044
Unclassified	6,612	.....	1,304	305	.....	8,348	.....	2,120	962	47
Totals	2,830,507	152,949	961,913	6,817,796	569,673	9,248,625	1,194,405	88,563	79,942	230,941

Market Classification	Mechanical Tubing	Pressure Tubing	Wire, Drawn	Nails & Staples	Wire, Barbed & Twisted	Woven Wire Fence	Bale Ties & Baling Wire	Black Plate	Tin & Terne Plate (hot-dipped)	Tin & Terne Plate (electrolytic)
Converters, Processors	3,824	5,303	888,776	1,651	685	215	.....	6,340	288	2,369
Forgings (except automotive)	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....
Bolts, Nuts, Rivets, Screws	.....	.....	253,700	.....	.....	.....	.....	166	.....	.....
Jobbers, Dealers, Distributors	137,987	97,483	266,204	412,721	55,970	193,879	46,530	87,112	32,298	124,310
Construction, Maintenance	18,335	21,659	61,075	6,501	696	3,125	46	2,293	729	2,885
Contractors' Products	42,744	4,635	70,309	725	.....	3,047	.....	18,825	1,987	2,928
Automotive	168,056	11,122	222,226	303	.....	.....	.....	12,101	2,746	31,275
Rail Transportation	1,370	2,696	1,806	3,249	934	1,772	.....	84	41	109
Shipbuilding, Marine Equip.	523	3,020	335	8	.....	.....	.....	109	.....	.....
Aircraft	4,305	260	1,761	5	.....	.....	.....	16	.....	59
Oil & Gas Drilling	17,469	6,143	244	20	.....	.....	.....	.....	65	106
Mining, Quarrying, Lumbering	2,012	58	2,307	330	3	34	.....	48	.....	.....
Agricultural	17,950	170	12,677	281	10	185	.....	887	7	614
Machinery, Indust. Equip., Tools	179,026	70,990	219,430	3,894	.....	.....	.....	10,548	3,072	13,088
Electrical Machinery & Equip.	8,790	1,105	53,035	379	11	.....	.....	2,213	2,199	7,884
Appliances, Utensils, Cutlery	8,473	4,819	50,006	313	.....	.....	.....	37,404	5,230	20,748
Other Domestic, Commercial Equip.	18,970	35	329,323	848	.....	.....	.....	69,595	7,931	10,907
Containers	3,869	.....	79,072	6,613	1	.....	1,448	329,414	352,656	4,128,793
Ordnance & Other Military	6,262	875	2,577	117	20	45	.....	31	812	8
Export	7,931	4,159	25,227	1,709	795	350	108	32,922	239,913	330,399
Unclassified	126,049	160,814	58,300	7,634	.....	.....	.....	.....	.....	.....
Totals	773,945	395,346	2,598,390	447,301	59,125	202,652	48,132	610,108	649,974	4,676,482

Tables compiled by STEEL from American Iron & Steel Institute figures.

WHO GOT THE STEEL—1957



Where Alloy and Stainless Steel Went

(Mill Shipments, 1957)	Alloy, other than stainless, net tons	Stainless & heat resisting, net tons
Converters, Processors	83,477	52,442
Forgings (except automotive)	400,165	15,014
Bolts, Nuts, Rivets, Screws	73,552	8,193
Jobbers, Dealers, Distributors	513,905	206,284
Construction, Maintenance	126,296	7,762
Contractors' Products	17,483	14,221
Automotive	1,432,613	106,303
Rail Transportation	221,062	1,987
Shipbuilding, Marine Equipment	99,590	2,342
Aircraft	46,461	25,815
Oil & Gas Drilling	167,970	812
Mining, Quarrying, Lumbering	28,985	522
Agricultural	28,192	621
Machinery, Industrial Equip., Tools	539,604	50,899
Electrical Machinery & Equip.	461,128	13,391
Appliances, Utensils, Cutlery	10,686	34,610
Other Domestic, Commercial Equipment	18,189	14,148
Containers	26,255	1,739
Ordnance & Other Military	76,841	2,404
Export	217,604	26,271
Unclassified	153,155	33,975
Totals	4,743,213	619,755

Track Spikes	Wheels	Axles	Bars, Hot-Rolled (and light shapes)	Bars, Concrete Reinforcing	Bars, Cold-Finished	Bars, Tool Steel	Standard Pipe	Oil Country Goods	Line Pipe	Market Classification
50	*3	7	206,679	20,071	2,438	431	35,650	22,688	48,530	Converters, Processors
.....	.....	.....	379,864	.....	3,127	907	.....	.....	.....	Forgings (except automotive)
.....	.....	.....	468,620	.....	54,011	—1	.....	.....	.....	Bolts, Nuts, Rivets, Screws
6,785	158	.....	1,267,091	926,434	319,738	16,669	1,823,175	2,092,982	836,684	Jobbers, Dealers, Distributors
1,752	3,455	1,637	779,950	1,087,189	3,838	78	214,992	37,453	2,656,490	Construction, Maintenance
.....	.....	.....	211,183	39,605	19,948	21	158,184	9	19,422	Contractors' Products
.....	.....	.....	1,954,323	.....	334,494	351	4,241	2	114	Automotive
62,836	362,483	202,260	320,644	492	4,862	5	8,916	.....	639	Rail Transportation
15	174	.....	59,445	29	5,176	9	15,801	.....	14,076	Shipbuilding, Marine Equip.
.....	.....	.....	24,676	.....	12,478	35	593	1	1,764	Aircraft
.....	229	.....	127,620	418	9,027	.....	12,054	358,950	28,084	Oil & Gas Drilling
724	3,863	1,281	121,629	2,969	4,316	1,376	4,417	312	1,877	Mining, Quarrying, Lumbering
.....	.....	.....	340,252	602	68,052	1	29,525	.....	773	Agricultural
22	8,993	588	787,847	.....	310,177	16,381	41,949	42	25,221	Machinery, Indust. Equip., Tools
.....	100	.....	126,512	.....	40,838	70	239,765	6	2,964	Electrical Machinery & Equip.
.....	.....	.....	15,032	466	27,075	86	7,515	.....	323	Appliances, Utensils, Cutlery
.....	.....	.....	74,160	16	38,191	151	7,521	8	1,378	Other Domestic, Commercial Equip.
.....	.....	.....	5,196	.....	82	.....	4,227	.....	.....	Containers
28	11	2	34,596	.....	16,617	22	1,008	.....	1,237	Ordnance & Other Military
1,540	7,043	4,985	127,765	105,090	8,013	85	54,936	310,401	525,097	Export
.....	.....	.....	134,316	116,746	36,790	62,035	.....	.....	53,840	Unclassified
73,752	386,512	210,760	7,567,400	2,300,127	1,319,288	98,712	2,664,469	2,822,854	4,218,513	Totals

Sheets, Hot-Rolled	Sheets, Cold-Rolled	Sheets, Galvanized	Sheets, Coated (all other)	Sheets & Strip, Electrical	Strip, Hot-Rolled	Strip, Cold-Rolled	Net Total	Percentage of Total	Market Classification
424,641	252,145	14,237	2,235	.....	120,735	129,519	3,396,529	4.25	Converters, Processors
5	28	.....	.....	.....	.....	11	1,056,036	1.32	Forgings (except automotive)
53,033	4,702	79	.....	.....	5,309	16,962	1,149,545	1.44	Bolts, Nuts, Rivets, Screws
843,174	1,013,309	748,317	9,679	3,511	111,063	49,902	14,507,308	18.16	Jobbers, Dealers, Distributors
502,991	125,964	155,040	5,364	9	62,924	9,352	12,523,285	15.67	Construction, Maintenance
709,172	761,318	825,190	14,432	1,645	78,686	104,497	3,403,580	4.26	Contractors' Products
3,220,327	6,211,944	124,196	118,890	3,172	476,386	398,830	14,227,096	17.81	Automotive
183,183	15,088	26,112	86	4,900	25,154	1,559	4,149,074	5.19	Rail Transportation
22,826	2,149	6,177	2,959	376	1,310	341	1,277,772	1.60	Shipbuilding, Marine Equip.
8,205	5,086	2,950	300	267	1,132	4,253	99,561	0.12	Aircraft
9,991	3,137	42	.....	41	942	189	700,501	0.88	Oil & Gas Drilling
14,161	2,926	725	27	130	6,066	493	328,803	0.41	Mining, Quarrying, Lumbering
193,246	74,008	103,548	2,833	268	79,090	3,368	1,098,102	1.37	Agricultural
362,972	192,509	25,699	7,130	10,411	108,536	54,311	4,512,298	5.65	Machinery, Indust. Equip., Tools
205,783	389,286	44,000	9,081	507,122	52,535	106,849	2,085,675	2.61	Electrical Machinery & Equip.
115,819	1,010,977	96,835	16,208	8,130	22,304	94,594	1,558,569	1.95	Appliances, Utensils, Cutlery
119,610	859,922	59,053	5,484	3,916	43,149	127,636	1,837,940	2.30	Other Domestic, Commercial Equip.
394,046	562,119	43,045	1,114	.....	177,886	113,233	6,237,583	7.81	Containers
27,355	21,088	4,040	20	1,172	1,896	6,302	356,406	0.45	Ordnance & Other Military
417,095	371,649	113,352	12,011	73,793	15,736	12,142	4,568,795	5.72	Export
2,357	.....	.....	.....	.....	1,621	39,919	820,119	1.03	Unclassified
7,829,992	11,879,354	2,392,637	207,853	618,863	1,392,460	1,274,262	79,894,577	100.00	Totals

Sheets, Strip . . .

Sheet & Strip Prices, Pages 175 & 176

One thing stands out in the steel market: Sheet consumers are fabricating substantially more tonnage than they are buying. Of the stocks of major steel products held in consuming plants, sheet inventories are the lightest.

Explanation: Demand for sheets started tapering off first and hasn't started to improve much. The trend in automotive specifications has been particularly disappointing. Even a mild lift from autos would boost the over-all market.

Quick Shipments — Buyers are looking to the sheetmakers for quick shipments, and the ability to meet such requests is an important factor in placing of tonnage. Producers of hot and cold rolled sheets are finding that those supplying tonnage quickest get the bulk of going business. Users are buying chiefly for spot needs and have little difficulty getting deliveries in two to three weeks, sometimes less.

At Pittsburgh, sheet and strip volume is down from that in February, but most producers are moderately optimistic about the possibilities of a pickup in orders before the end of March.

Curtailing—From Detroit comes word that Ford Motor Co. will be operating on reduced schedules the next several weeks. One Ford supplier says company purchasing agents indicate April will be Ford's slowest month. Chevrolet, until now one of the strongest producers, has canceled an estimated half of its April orders. Both Chevy and Ford are planning cutbacks in production.

Chicago area sheetmakers think construction, particularly private housing, will lead the parade upward. Both normally have seasonal surges in the spring and construction may get there first this time. This would buoy up many steel products, particularly galvanized sheets, hot-rolled sheets, conduit, and nails.

Galvanized sheets are in better demand than had been expected in the Midwest, but there is plenty of room for expansion in volume. Right now, there is a lot of galvanized tonnage going into ductwork in large office buildings being modernized with air conditioning.

Volume Up—In New England, March bookings of sheets and strip are below expectations, but volume is slightly above that in February. Slit sheets are cutting into low carbon strip volume in that market.

A promising note: Several miscellaneous users of sheets served by Pittsburgh mills give signs of growing demand.

Another encouraging sign: Demand for flat-rolled products shows signs of substantially increasing on the West Coast. April delivery bookings there are said to be above those for March.

Gage and width extras on cold-rolled carbon strip have been reduced by one Pennsylvania producer. This is the first break in the flat-rolled price structure reported in recent months.

Stainless Steel . . .

Stainless Steel Prices, Page 178

Consumption of stainless steel is off sharply, report Detroit district sellers. One maker in the area says

SAD SOAK TANK TALE
...WITH A HAPPY ENDING
BILL*, I'VE CALLED YOU IN BECAUSE I'VE GOT TO CUT CLEANING COSTS ON THE ALUMINUM SHEETS, CASTINGS AND EXTRUSIONS WE PREPARE FOR ANODIZING.
OK BY ME, KEN. PUTTING THE AXE TO A CUSTOMER'S COSTS IS A PENNSALT SPECIALTY. WHAT'S YOUR PROBLEM?
*BILL WILSON, PENNSALT REPRESENTATIVE
NOT WHEN YOU USE PENNSALT A-28. IT'S AN ANHYDROUS POWDERED ALKALINE CLEANER THAT'S SPECIALLY INHIBITED TO PREVENT ATTACK ON ALUMINUM. AND A-28 DOES A GREAT JOB OF REMOVING RED AND BLACK MARKING INKS, FINGER MARKS AND SHOP SOILS.
LATER THE SAME WEEK
I WOULDN'T BELIEVE IT IF I HADN'T SEEN IT WITH MY OWN EYES. WE'VE COMPLETELY ELIMINATED HAND WIPING. EVERYBODY HERE IS PLEASED AS PUNCH WITH THE RESULTS.

sales to all users are 30 per cent under last year's level at this season. This producer reports March orders no better than February's. The outlook for April sales is cloudy and short leadtime demanded by purchasers makes it almost impossible for sellers to plan ahead.

Steel Bars . . .

Bar Prices, Page 174

Deliveries continue easy, and no immediate pickup in demand appears in prospect in the sluggish steel bar market. Buying is light and highly diversified. That's true of both hot-rolled and cold-drawn material.

Pittsburgh suppliers of hot bars are encouraged by the belief that the decline in order volume has halted, but they are not willing to predict that a sales gain is immediately ahead. They are still accepting orders for March delivery, some standard sizes being shipped from mill stocks.

Contributing to the market sluggishness are the heavy stocks still being carried by some manufacturers. Also, many fabricators have cut back their operations to a four-day week. This means they have to carry less tonnage in inventory to support current manufacturing schedules.

Bolt and nut manufacturers are ordering only fill-in tonnages, still depending largely on inventories. Forge shops in New England are buying little new tonnage, and requirements of screw machine shops are sluggish. Cold drawers are buying hot bars on a limited basis, while the railroads are placing little additional tonnage. Warehouses, which supply a lot of small diversified manufacturing needs, are specifying in only moderate volume.

Reinforcing Bars . . .

Reinforcing Bar Prices, Page 174

Spring requirements for building bars and other reinforcing steel items are beginning to open up in encouraging volume. Heavier buying is reported in New England, 5000 tons being placed there for educational facilities. More bridge tonnage is being estimated in the district, though inquiry for welded highway mesh is slow to expand.

The award of 3040 tons of reinforcing bars involved in the third phase of Seattle's state-financed viaduct is expected shortly. Morrison-Knudsen Co. and Rumsey & Co., Seattle, jointly are low at $2,987,878 on the general contract.

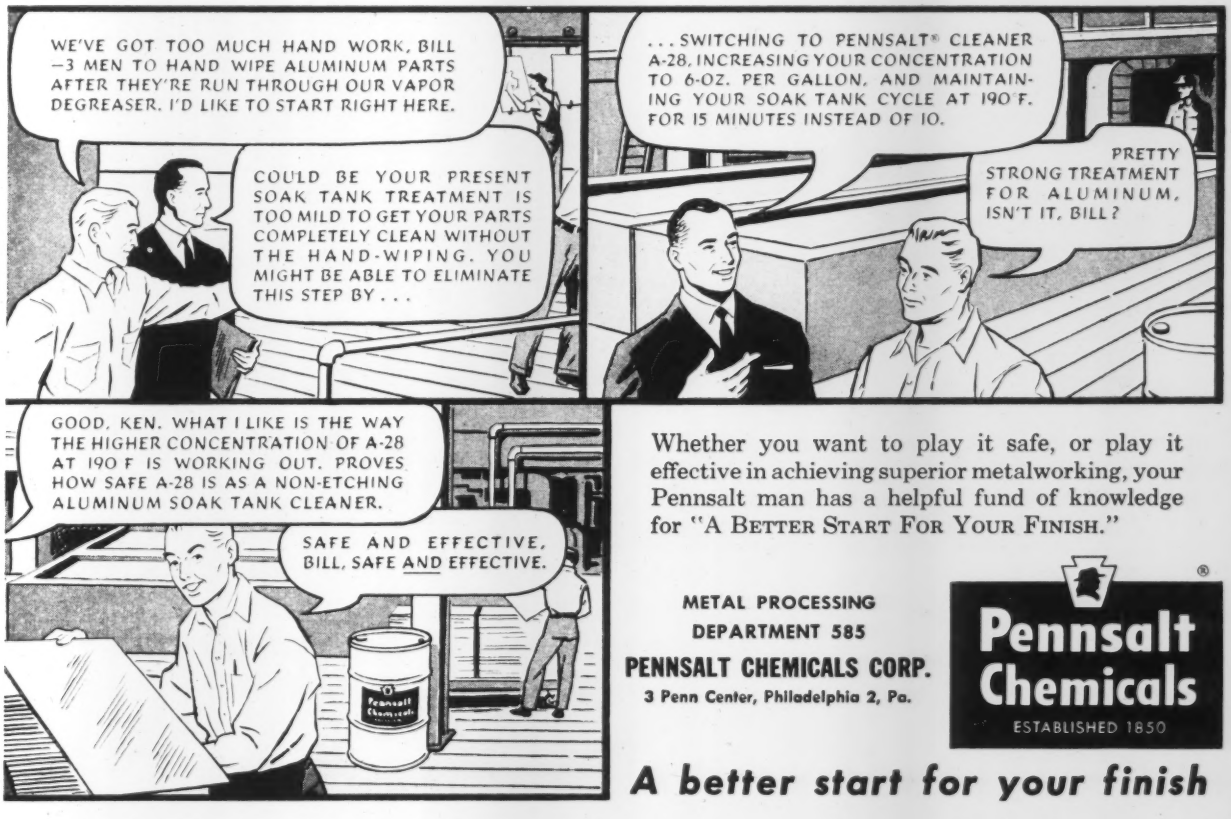
Distribution of reinforcing bar orders is somewhat unbalanced due to price competition.

Wire . . .

Wire Prices, Pages 176 & 177

Not much change in volume is noted in manufacturers' wire sales. Orders appear to be holding at about February levels. Demand for wire specialties seems weaker. A slight quickening in demand for merchant products, though, serves to inject a little life into the market, though current buying is not in typical March volume.

Usually, demand for farm fence begins to increase at this season. Because of continued heavy snows in New England and other northern states, sellers of merchant items and construction wire think the seasonal rise in demand will be delayed until late March or early April. Then,


WE'VE GOT TOO MUCH HAND WORK, BILL —3 MEN TO HAND WIPE ALUMINUM PARTS AFTER THEY'RE RUN THROUGH OUR VAPOR DEGREASER. I'D LIKE TO START RIGHT HERE.
COULD BE YOUR PRESENT SOAK TANK TREATMENT IS TOO MILD TO GET YOUR PARTS COMPLETELY CLEAN WITHOUT THE HAND-WIPING. YOU MIGHT BE ABLE TO ELIMINATE THIS STEP BY . . .
. . . SWITCHING TO PENNSALT® CLEANER A-28, INCREASING YOUR CONCENTRATION TO 6-OZ. PER GALLON, AND MAINTAINING YOUR SOAK TANK CYCLE AT 190°F. FOR 15 MINUTES INSTEAD OF 10.
PRETTY STRONG TREATMENT FOR ALUMINUM, ISN'T IT, BILL?
GOOD, KEN. WHAT I LIKE IS THE WAY THE HIGHER CONCENTRATION OF A-28 AT 190°F IS WORKING OUT. PROVES HOW SAFE A-28 IS AS A NON-ETCHING ALUMINUM SOAK TANK CLEANER.
SAFE AND EFFECTIVE, BILL, SAFE AND EFFECTIVE.
Pennsalt Chemicals

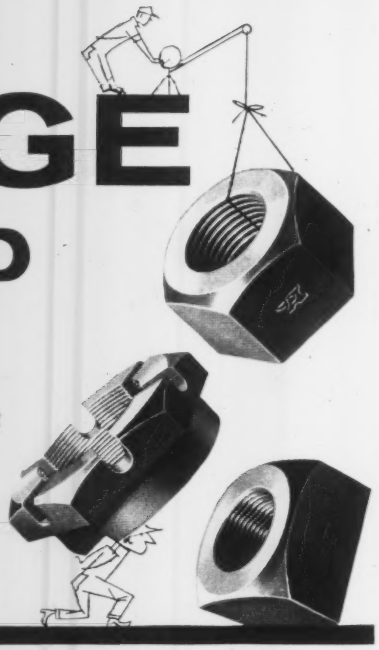
Whether you want to play it safe, or play it effective in achieving superior metalworking, your Pennsalt man has a helpful fund of knowledge for "A BETTER START FOR YOUR FINISH."

METAL PROCESSING
DEPARTMENT 585
PENNSALT CHEMICALS CORP.
3 Penn Center, Philadelphia 2, Pa.

Pennsalt Chemicals®
ESTABLISHED 1850

A better start for your finish

DYSON LARGE FORGED NUTS



1¾" thru 8" BOLT DIAMETER

- Regular, high tensile and stainless steels
- Heavy, regular, full, half, jam, sleeve, specials, etc.
- Modern machining and heat treating facilities
- Complete testing equipment
- Adequate steel stocks assure prompt delivery

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5125 St. Clair Avenue, Cleveland 3, Ohio, Telephone: HEnderson 1-6157

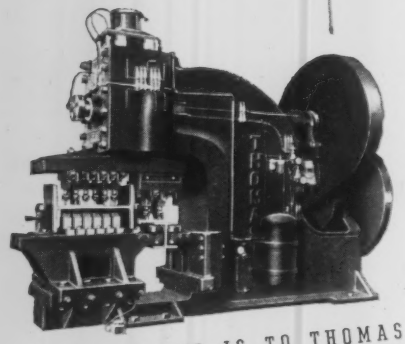
SEND FOR THE DYSON LARGE NUT CATALOG. 36-page catalog contains dimensions, specifications and prices on Dyson large forged nuts, plus data on large eye bars, bolts and studs.

TRADE MARK

Our Specialty **LARGE NUTS . . . BOLTS . . . STUDS . . . EYE BARS**

BEAM PUNCHING

without tool change



THE newly designed Thomas Beam Punches are built in sizes to handle beams up to 12"-18"-24"-30" and 36", web and flange punching, with a single tool set-up. Any of the five sizes may be used with or without a Thomas spacing Table, depending on production needs.

THE TREND IS TO THOMAS

THOMAS
MACHINE MANUFACTURING CO.
PITTSBURGH 23, PA.

• *Write for further information*

PUNCHES • SHEARS • PRESSES • BENDERS • SPACING TABLES

51 a

sales are expected to pick up sharply.

Imported material, particularly nails and barbed wire, is an increasingly competitive factor in the market in some areas.

In New England, orders for manufacturers' wire and heading grades are spotty with most buying for prompt shipments. Wire rope and woven wire cloth prices are easier in the district.

Automotive buying continues irregular, and forward ordering absent.

Plates . . .

Plate Prices, Page 174

Sellers of sheared plates are scrambling for business. Their backlogs, while better than most other major products, have been dropping rapidly. One reason is that they had farther to drop.

Most consumers hold fair stocks. They took tonnage until almost the end of last year; buyers of other products, notably sheets and bars, started curtailing months earlier.

Shipwork is consuming considerable tonnage. While there have been some cancellations of tanker work, a quickening in placements of other types of merchant ships is noted.

In the East, larger plate tonnage on ship account is expected. Recently, the New York Shipbuilding Corp., Camden, N. J., and the Sun Shipbuilding & Dry Dock Co., Chester, Pa., each booked two merchant ships. New York Shipbuilding has a contract for a nuclear powered, passenger-cargo ship—the *Savannah*—for which the keel will be laid about May 1. The company is placing steel for this vessel.

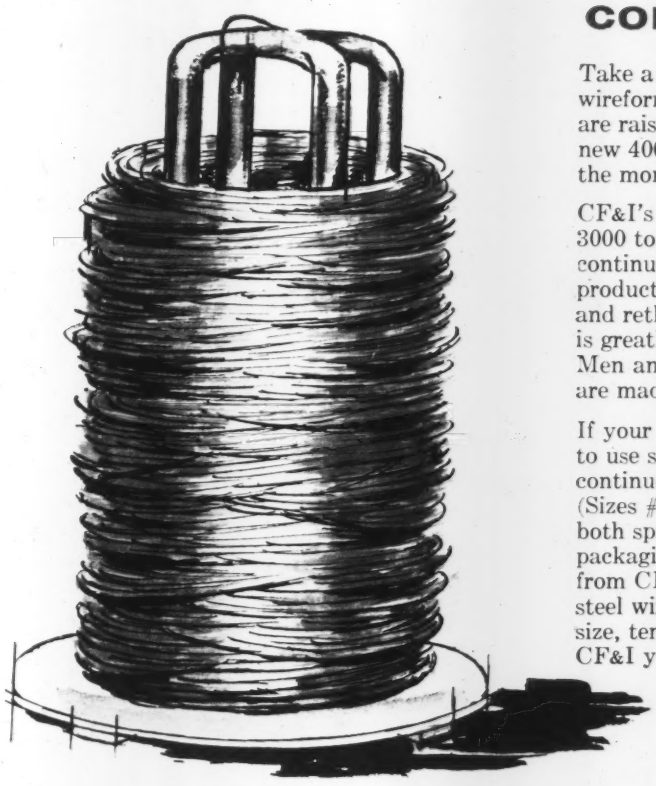
While platemakers are experiencing a leveling off in demand, they think a mild improvement will set in over the next few weeks. This thinking is pinned largely on the expectation of a pickup in building construction and tank fabrication. Carbuilding requirements are slack, with domestic freight car awards so far this year the lightest since 1954. Freight car repairs also are slow, while demand for locomotives continues dull.

Several large plate users in the Pittsburgh area—makers of electrical equipment and construction firms—say their stocks of steel are

for longer runs and lower costs

buy CF&I WIRE

in 3000-4000 lb. continuous lengths



Take a cost-conscious look at your wireforming operation. If short length coils are raising costs and cutting profits, CF&I's new 4000-lb. "spider" package may provide the money-saving answer to your problem.

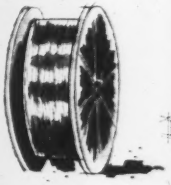
CF&I's returnable "spiders" carry from 3000 to 4000 lbs. of wire in a single continuous length. They can increase production because downtime to stop, reload and rethread your wireworking machines is greatly reduced. Scrap losses are minimized. Men and materials handling equipment are made available for other work.

If your manufacturing process is not equipped to use spiders, order our 200-2000 lb. continuous-length steel-strapped wire coils. (Sizes #13AWG and coarser apply for both spider and coils.) Other standard packaging methods are, of course, available from CF&I. For high or low carbon steel wire; round, flat or shaped; in any size, temper, grade or finish, make CF&I your source of supply.

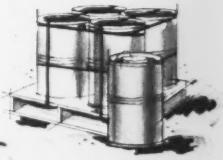
OTHER CF&I STANDARD PACKAGING METHODS

Steel strapped coils (200-2000 lbs.)

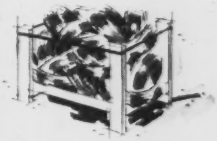
Non-returnable spiders (500-700 lbs. capacity)



Reels (500-800 lbs. capacity)



Pay-off paks



Steel strapped wooden rack

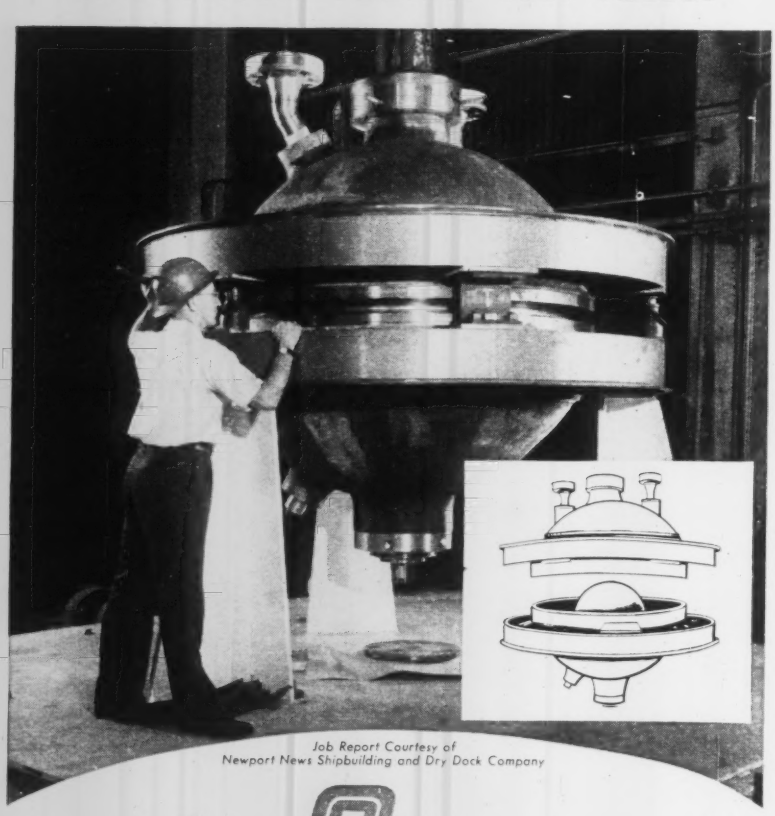
CF&I-WICKWIRE WIRE

THE COLORADO FUEL AND IRON CORPORATION

6018

THE COLORADO FUEL AND IRON CORPORATION—Albuquerque • Amarillo • Billings • Boise • Butte • Denver • El Paso • Ft. Worth • Houston • Kansas City • Lincoln (Neb.) Oklahoma City • Phoenix • Pueblo • Salt Lake City • Wichita • **PACIFIC COAST DIVISION**—Los Angeles • Oakland • Portland • San Francisco • San Leandro • Seattle • Spokane **WICKWIRE SPENCER STEEL DIVISION**—Atlanta • Boston • Buffalo • Chicago • Detroit • New Orleans • New York • Philadelphia • **CF&I OFFICES IN CANADA:** Montreal • Toronto **CANADIAN REPRESENTATIVES AT:** Calgary • Edmonton • Vancouver • Winnipeg

NEW WELDING PROCESS used to fabricate reactor test vessel

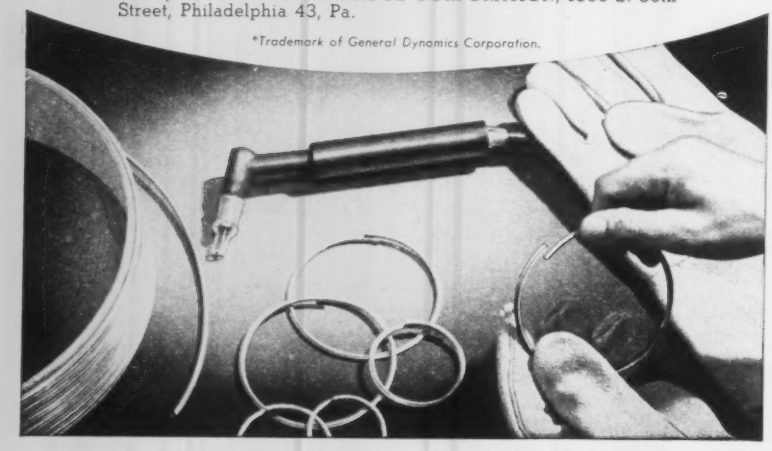


Job Report Courtesy of
Newport News Shipbuilding and Dry Dock Company

the ARCOS EB* WELD INSERT

To simplify and speed joining the halves of this pressure vessel shell, and insure corrosion resistant root passes, a preplaced Arcos Consumable Insert was used. With this method, *only outside welding* was required to produce sound welds with uniform contours on the inaccessible inside surface. The welds readily passed Radiograph inspection for freedom from porosity, slag and other inclusions. The EB Weld Insert can save *you* time and money. Write for details. ARCOS CORPORATION, 1500 S. 50th Street, Philadelphia 43, Pa.

*Trademark of General Dynamics Corporation.



too large to warrant purchasing additional plate tonnage this month.

Tin Plate . . .

Tin Plate Prices, Page 176

Tin plate continues to provide the brightest spot in the current steel market. Demand still is strong. Operationwise, the tin mills are close to capacity. Tin plate is the only major steel product engaging facilities at, or close to, top speed.

Revisions in coiling extras and deductions on electrolytic tin plate and canmaking black plate were announced last week by Jones & Laughlin Steel Corp., Pittsburgh. The revised list (per base box) on electrolytic tin plate: 12,000 lb or over, deduct $0.35; under 12,000 to 6000 lb inclusive, deduct $0.15; under 6000 to 4000 lb inclusive, none; under 4000 lb, add $0.50. The old listing was: Producer's option up to 16,000 lb, deduct $0.35; producer's option up to 8000 lb, deduct $0.15; producer's option up to 4000 lb, add $0.50.

The list on canmaking quality black plate: 12,000 lb or over, deduct $0.25; under 12,000 to 6000 lb inclusive, deduct $0.10; under 6000 to 4000 lb inclusive, none; under 4000 lb, add $0.40. The old list: Option up to 16,000 lb, deduct $0.25; option up to 8000 lb, deduct $0.10; option up to 4000 lb, add $0.40.

Tubular Goods . . .

Tubular Goods Prices, Page 178

Pipemakers and other tubular goods producers are confident business will pick up noticeably as the year advances. Makers of specialty tubing and seamless oil country goods think current slowness in sales will continue through March. Demand is still adversely affected by substantial stocks held by well drillers and distributors.

One manufacturer of buttweld pipe in the Pittsburgh area says that the normal March upswing in plumbing and heating requirements for pipe is being hampered by continued cold weather. This maker thinks that sales will improve early in April.

Spring demand for cast iron pipe and fittings is opening up in the Pacific Northwest. Several cities in Washington are taking bids this month on needed tonnages. Pipe sales agencies can promise prompt

deliveries. Among cities actively in the market are: Tacoma, Centralia, Kent, Puyallup, Anacortes, and Ellensburg. A large water system project at Hoquiam, Wash., involving 1000 tons of cast pipe, is under consideration.

Jones & Laughlin Steel Corp.'s recently developed cold-drawn special smooth ID electricweld steel tubing is now available in a new maximum wall thickness of 3/16-in. (0.1875-in.).

Semifinished Steel . . .

Semifinished Prices, Page 174

Sizable increases in steelmaking operations were made last week by Wheeling Steel Corp. Three blast furnaces resumed operations at its South Works, Steubenville, Ohio, five of the company's six stacks now being in production.

The bessemer steelmaking department at the Mingo Junction (Ohio) Works, idled in February, was restored to production Mar. 8.

Wheeling reports orders are still coming in on a "day-to-day" basis, and long range planning of operations continues difficult. The volume of new business is increasing.

Operations are still sluggish in the Detroit area. Last week, Jones & Laughlin's Rotary Div. closed down operations temporarily.

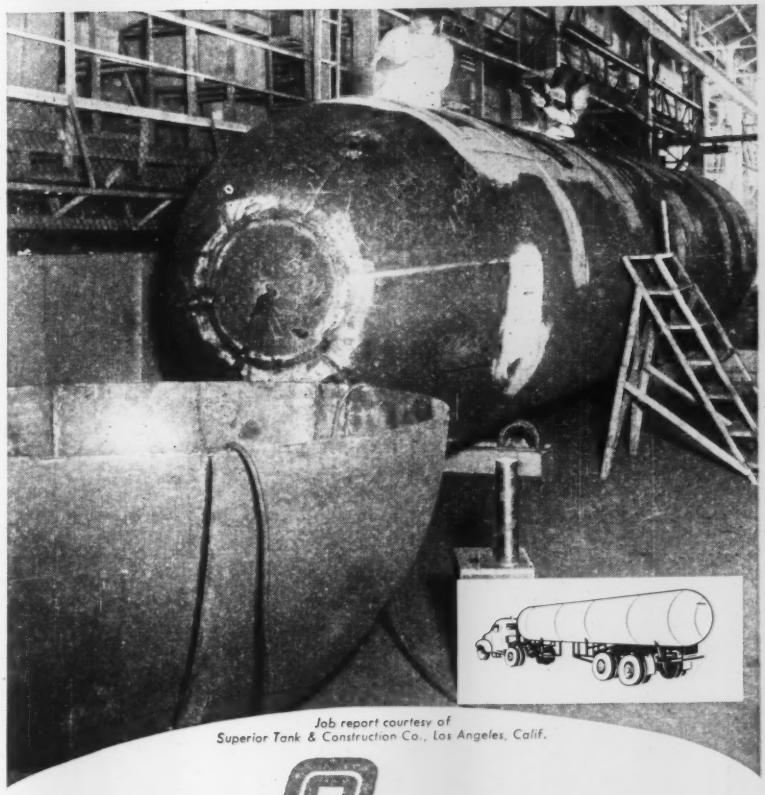
Installation of an electric furnace and rolling mill facilities for Florida Steel Corp. is progressing at Tampa, Fla., reports McDonald & Co., Cleveland, underwriter. Steel production is expected to start in August or September.

Equipment includes an electric furnace, an 18-in. roughing mill, a 12 in. 6 stand rolling mill, a reheating furnace, and auxiliary facilities.

Steel output of 25,000 to 30,000 tons annually will supply about 30 per cent of the company's requirements.

On Jan. 27, stockholders of Florida Steel voted to acquire the Bushnell Steel Co. and Bushnell Steel Construction Co., Jacksonville, Fla., in exchange for 199,800 common shares. Bushnell Steel, with annual sales of about $3.5 million, produces structural products. It will operate as a division of Florida Steel, with Bushnell Steel Construction a wholly owned subsidiary.

How X-Ray Quality Welds Make Low Alloy Steels Pay Off



Job report courtesy of
Superior Tank & Construction Co., Los Angeles, Calif.

WELD WITH ARCOS

LOW HYDROGEN ELECTRODES

The vessel being welded is part of an L.P.G. tank truck. For high strength with low weight—USS "T-1" steel is used and welded with Arcos Ductilend 110 Electrodes. These tanks meet or exceed ASME code requirements . . . and all Ductilend 110 welds qualify with X-ray soundness. Ductilend 110 is an Arcos Low Hydrogen Electrode especially developed for welding high strength notch tough steels of the 110,000 psi tensile strength range. Data sheet on request. ARCOS CORPORATION • 1500 South 50th Street, Philadelphia 43, Pa.

Ore Stocks Up Sharply

Stocks of iron ore and iron ore agglomerates in the U. S. and Canada totaled 61,932,490 gross tons at the end of January, reports the American Iron Ore Association and the American Iron & Steel Institute. That total was up sharply from the 49,323,481 tons held at the end of January, 1957. Details are given in the accompanying table.

Receipts of ore during the month were 3,144,518 tons, against 3,564,479 in the like month a year ago. Consumption in the month amounted to 8,039,875 tons, compared with 12,044,948 in January last year. (See table for breakdown.)

There were only 176 out of 275 blast furnaces operating in the U. S. and Canada at the end of January. A year ago the number was 259 out of 275. Comparative operations data by districts:

Number of Stacks Active At End of Month

Districts	January, 1958	January, 1957
Eastern	43	50
Pitts-Youngstown	53	91
Cleveland-Detroit	14	23
Chicago	29	48
Southern	16	22
Western	10	12
Total U. S.	165	246
Total Active in Canada	11	13

Iron Ore Statistics for January, 1958

RECEIPTS OF IRON ORE & AGGLOMERATES IN U. S. AND CANADA—JANUARY, 1958

(Gross tons; original source of iron ore)

	—United States Ores—		—Canadian Ores—		Foreign Ores	Total
	L. Superior	Other U. S.	L. Superior	Other	(Except Can.)	Receipts
Monthly:						
U. S. plants	144,195	1,315,209	116(b)	17,088	1,601,219	3,077,595
Canadian plants	.....	.....	37,833	19,260	9,830	66,923
Total U. S.-Canada	144,195	1,315,209	37,717	36,348	1,611,049	3,144,518
YEAR TO DATE:						
U. S. plants	144,195	1,315,209	116(b)	17,088	1,601,219	3,077,595
Canadian plants	.....	.....	37,833	19,260	9,830	66,923
Total U. S.-Canada	144,195	1,315,209	37,717	36,348	1,611,049	3,144,518

CONSUMPTION OF IRON ORE & AGGLOMERATES IN U. S. AND CANADA—JANUARY, 1958

	—United States Ores—		—Canadian Ores—			
YEAR TO DATE:	L. Superior	Other U. S.	L. Superior	Other	Foreign Ores	Total
United States	4,254,658	1,262,384	190,998	390,082	1,507,107	7,605,229
Canada	284,692	.....	49,337	79,788	10,829	424,646
Total U. S.-Canada	4,539,350	1,262,384	240,335	469,870	1,517,936	8,029,875
CONSUMPTION IN U. S. Districts:						
Eastern	680,263	174,226	34,670	85,118	930,737	1,905,014
Pitts.-Youngstown	1,327,146	107,472	67,194	276,454	361,179	2,139,445
Cleve.-Detroit	816,837	29,834	89,134	28,510	44,567	1,008,882
Chicago	1,430,412	(a)	(a)	.....	(a)	1,430,412
Southern	(a)	527,255	.....	(a)	170,624	697,879
Western	.....	423,597	.....	.....	.....	423,597
In United States:						
Blast furnaces	3,515,163	910,694	165,486	283,858	575,490	5,450,691
Steel furnaces	135,199	66,476	141	4,079	343,914	549,809
Sintering plants (8)	604,296	285,170	25,371	102,145	587,703	1,604,957
Miscellaneous (9)	.....	44	.....	.....	.....	44
Total U. S.	4,254,658	1,262,384	190,998	390,082	1,507,107	7,605,229
IN CANADA:						
Blast furnaces	207,577	.....	48,920	55,436	.....	311,933
Steel furnaces	4,546	.....	.....	8,501	10,221	23,268
Sintering (8)	72,531	.....	417	15,838	608	89,394
Miscellaneous (9)	38	.....	.....	13	.....	51
Total Canada	284,692	.....	49,337	79,788	10,829	424,646
Total U. S.-Canada	4,539,350	1,262,384	240,335	469,870	1,517,936	8,029,875

STOCKS OF IRON ORE AND ORE AGGLOMERATES ON HAND JAN. 31, 1958

(Gross tons; original sources)

	—United States Ores—		—Canadian Ores—			
At U. S. FURNACE YARDS:	L. Superior	Other U. S.	L. Superior	Other	Foreign Ores	Total
Districts						
Eastern	5,086,105	204,452	284,462	1,890,187	2,737,062	10,202,268
Pitts.-Youngstown	10,952,646	76,414	672,719	2,457,122	3,404,806	17,563,144
Cleve.-Detroit	9,386,261	105,986	423,042	312,074	181,904	10,409,267
Chicago	11,855,490	(a)	(a)	.....	(a)	11,855,490
Southern	(a)	2,234,307	.....	(a)	1,246,035	3,480,342
Western	.....	837,839	.....	.....	.....	837,829
Total	37,280,502	3,458,998	1,380,223	4,659,383	7,569,807	54,348,913
At U. S. DOCKS:						
Lake Erie	3,280,502	.....	113,505	872,968	.....	4,858,655
Other	.....	.....	.....	(a)	(a)	(a)
Total	3,872,182	.....	113,505	872,968	(a)	4,858,655
Total U. S. stocks	41,152,684	3,458,998	1,493,728	5,532,351	7,569,807	59,207,568
Total Canadian Stocks	2,006,599	.....	35,200	525,939	157,184	2,724,922
Total U. S.-Canada	43,159,283	3,458,998	1,528,928	6,058,290	7,726,991	61,932,490

(a) Small tonnage included in other districts to avoid disclosure.
(b) Tonnage shown is credit.
(8) Iron ore and iron ore concentrates consumed in sintering plants not at mine site.
(9) Sold to non-reporting companies or used for purposes not listed.
Data from American Iron & Steel Institute and American Iron Ore Association.

Steel Imports Hit Coast

Foreign steel competition is increasing on the West Coast. Last year, finished steel imports amounted to an estimated 200,000 tons. That's 20 per cent above the 1956 total. Compared with five years ago, volume is up 75 to 80 per cent.

Since foreign steel undersells domestic products by as much as 25 per cent, local mills find it increasingly difficult to meet such severe price competition. To make the situation even more exasperating for west coast mills, imported steel prices in their area are higher than those quoted in the East.

Structural Shapes . . .

Structural Shape Prices, Page 174

Although backlogs are still shrinking, medium and large sized structural fabricators are holding fairly comfortable orders on books. The small shops, though, are having difficulty maintaining operations, a situation that is leading to price concessions.

Structural steel contracts are spotty. But there is a further accumulation of inquiry which should stimulate buying over coming weeks. Architects and construction engineers have considerable work on their boards. That work should contribute to a pickup soon. Little seasonal improvement has developed so far.

Steel is in plentiful supply—wide flange sections as well as standard structurals. One producer, Phoenix Iron & Steel Co., Phoenixville, Pa., is resuming production of ingots after a suspension of more than three months.

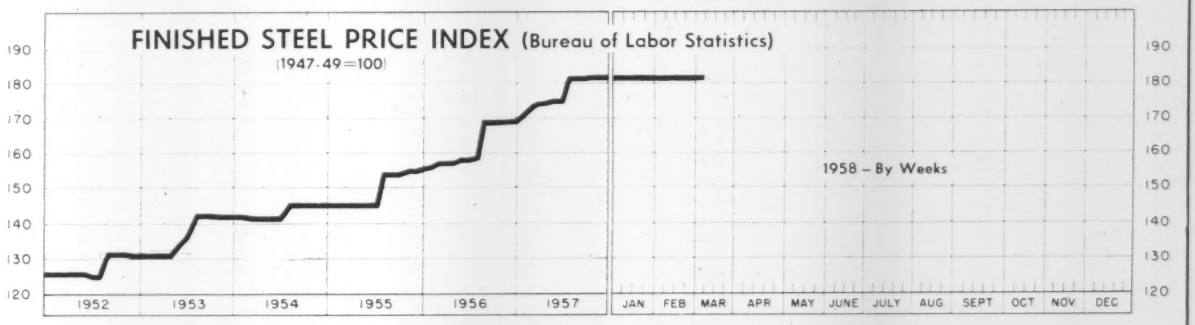
About 2500 tons of structural shapes were placed recently with Portland, Oreg., and Seattle fabricators. The largest award, 1500 tons for a railroad warehouse at Portland, went to the Isaacson Iron Works, Seattle.

Highway projects and schools are accounting for substantial tonnage in the Pacific Northwest. But increasing competition for jobs is reported in the area, and several projects have been awarded at surprisingly low prices.

Contracts for structural steel, notably bridge tonnage, are being placed less promptly in New Eng-

(*Please turn to Page* 185)

Price Indexes and Composites



Mar. 4, 1958	Week Ago	Month Ago	Feb. Avg.	Year Ago
181.7	181.8	181.8	181.8	173.9

AVERAGE PRICES OF STEEL (Bureau of Labor Statistics)

Week Ended Mar. 4

Prices include mill base prices and typical extras and deductions. Units are 100 lb except where otherwise noted in parentheses. For complete description of the following products and extras and deductions applicable to them, write to STEEL.

Rails, Standard No. 1	$5.600	Bars, Reinforcing	6.210
Rails, Light, 40 lb	7.067	Bars, C.F., Carbon	10.360
Tie Plates	6.600	Bars, C.F., Alloy	13.875
Axles, Railway	9.825	Bars, C.F., Stainless, 302 (lb)	0.553
Wheels, Freight Car, 33 in. (per wheel)	60.000	Sheets, H.R., Carbon	6.192
Plates, Carbon	6.150	Sheets, C.R., Carbon	7.089
Structural Shapes	5.942	Sheets, Galvanized	8.270
Bars, Tool Steel, Carbon (lb)	0.535	Sheets, C.R., Stainless, 302 (lb)	0.688
Bars, Tool Steel, Alloy, Oil Hardening Die (lb)	0.650	Sheets, Electrical	12.025
Bars, Tool Steel, H.R., Alloy, High Speed, W 6.75, Cr 4.5, V 2.1, Mo 5.5, C 0.60 (lb)	1.355	Strip, C.R., Carbon	9.243
Bars, Tool Steel, H.R., Alloy, High Speed, W18, Cr 4, V 1 (lb)	1.850	Strip, C.R., Stainless, 430 (lb)	0.493
Bars, H.R., Alloy	10.525	Strip, H.R., Carbon	6.095
Bars, H.R., Stainless, 303 (lb)	0.525	Pipe, Black, Buttweld (100 ft)	19.814
Bars, H.R., Carbon	6.425	Pipe, Galv., Buttweld (100 ft)	23.264
		Pipe, Line (100 ft)	199.023
		Casing, Oil Well, Carbon (100 ft)	194.499
		Casing, Oil Well, Alloy (100 ft)	304.610
		Tubes, Boiler (100 ft)	49.130
		Tubing, Mechanical, Carbon (100 ft)	24.953
		Tubing, Mechanical, Stainless, 304 (100 ft)	205.608
		Tin Plate, Hot-dipped, 1.25 lb (95 lb base box)	9.783
		Tin Plate, Electrolytic, 0.25 lb (95 lb base box)	8.483
		Black Plate, Canmaking Quality (95 lb base box)	7.583
		Wire, Drawn, Carbon	10.225
		Wire, Drawn, Stainless, 430 (lb)	0.653
		Bale Ties (bundles)	7.967
		Nails, Wire, 8d Common	9.828
		Wire, Barbed (80-rod spool)	8.719
		Woven Wire Fence (20-rod roll)	21.737

STEEL's FINISHED STEEL PRICE INDEX*

	Mar. 5 1958	Week Ago	Month Ago	Year Ago	5 Yr Ago
Index (1935-39 avg=100)	239.15	239.15	239.15	227.41	181.31
Index in cents per lb	6.479	6.479	6.479	6.161	4.912

STEEL's ARITHMETICAL PRICE COMPOSITES*

Finished Steel, NT	$145.42	$145.42	$145.42	$139.51	$110.98
No. 2 Fdry Pig Iron, GT	66.49	66.49	66.49	63.70	55.04
Basic Pig Iron, GT	65.99	65.99	65.99	63.24	54.66
Malleable Pig Iron, GT	67.27	67.27	67.27	64.49	55.77
Steelmaking Scrap, GT	37.17	37.17	37.33	51.67	45.00

*For explanation of weighted index see STEEL, Sept. 19, 1949, p. 54; of arithmetical price composite, STEEL, Sept. 1, 1952, p. 130.

Comparison of Prices

Comparative prices by districts, in cents per pound except as otherwise noted. Delivered prices based on nearest production point.

FINISHED STEEL

	Mar. 5 1958	Week Ago	Month Ago	Year Ago	5 Yr Ago
Bars, H.R., Pittsburgh	5.425	5.425	5.425	5.075	3.95
Bars, H.R., Chicago	5.425	5.425	5.425	5.075	3.95
Bars, H.R., deld., Philadelphia	5.725	5.725	5.725	5.365	4.502
Bars, C.F., Pittsburgh	7.30*	7.30*	7.30*	6.85*	4.925
Shapes, Std., Pittsburgh	5.275	5.275	5.275	5.00	3.85
Shapes, Std., Chicago	5.275	5.275	5.275	5.00	3.85
Shapes, deld., Philadelphia	5.545	5.545	5.545	5.31	4.13
Plates, Pittsburgh	5.10	5.10	5.10	4.85	3.90
Plates, Chicago	5.10	5.10	5.10	4.85	3.90
Plates, Coatesville, Pa.	5.10	5.10	5.10	5.25	4.35
Plates, Sparrows Point, Md.	5.10	5.10	5.10	4.85	3.90
Plates, Claymont, Del.	5.10	5.10	5.10	5.70	4.35
Sheets, H.R., Pittsburgh	4.925	4.925	4.925	4.675	3.775
Sheets, H.R., Chicago	4.925	4.925	4.925	4.675	3.775
Sheets, C.R., Pittsburgh	6.05	6.05	6.05	5.75	4.575
Sheets, C.R., Chicago	6.05	6.05	6.05	5.75	4.575
Sheets, C.R., Detroit	6.05-6.15	6.05-6.15	6.05-6.15	5.75-5.85	4.775
Sheets, Galv., Pittsburgh	6.60	6.60	6.60	6.30	5.075
Strip, H.R., Pittsburgh	4.925	4.925	4.925	4.675	3.975-4.225
Strip, H.R., Chicago	4.925	4.925	4.925	4.675	3.725
Strip, C.R., Pittsburgh	7.15	7.15	7.15	6.85	5.10-5.80
Strip, C.R., Chicago	7.15	7.15	7.15	6.85	5.35
Strip, C.R., Detroit	7.25	7.25	7.25	6.95	5.30-6.05
Wire, Basic, Pittsburgh	7.65	7.65	7.65	7.20	5.225-5.475
Nails, Wire, Pittsburgh	8.95	8.95	8.95	8.49	6.35
Tin plate (1.50 lb) box, Pitts.	$10.30	$10.30	$10.30	$9.95	$8.95

*Including 0.35c for special quality.

SEMIFINISHED STEEL

Billets, forging, Pitts. (NT)	$96.00	$96.00	$96.00	$91.50	$70.50
Wire rods, 7/32-5/8" Pitts.	6.15	6.15	6.15	5.80	4.425

PIG IRON, Gross Ton

	Mar. 5 1958	Week Ago	Month Ago	Year Ago	5 Yr Ago
Bessemer, Pitts.	$67.00	$67.00	$67.00	$64.50	$55.50
Basic, Valley	66.00	66.00	66.00	64.50	54.50
Basic, deld., Phila.	70.41	70.41	70.01	66.26	59.25
No. 2 Fdry, Neville Island, Pa	66.50	66.50	66.50	65.00	55.00
No. 2 Fdry, Chicago	66.50	66.50	66.50	64.00	55.00
No. 2 Fdry, deld., Phila.	70.91	70.91	70.51	66.76	59.75
No. 2 Fdry, Birm.	62.50	62.50	62.50	59.00	51.38
No. 2 Fdry (Birm.) deld. Cin.	70.20	70.20	70.20	66.70	58.93
Malleable, Valley	66.50	66.50	66.50	64.00	55.00
Malleable, Chicago	66.50	66.50	66.50	64.00	55.00
Ferromanganese, Duquesne	245.00†	245.00†	245.00†	255.00†	228.00*

†74-76% Mn, net ton. *75-82% Mn, gross ton, Etna, Pa.

SCRAP, Gross Ton (Including broker's commission)

No. 1 Heavy Melt, Pittsburgh	$36.50	$35.50	$34.50	$51.50	$44.00
No. 1 Heavy Melt, E. Pa.	38.50	38.50	38.50	56.00	48.50
No. 1 Heavy Melt, Chicago	36.50	37.50	39.00	47.50	42.50
No. 1 Heavy Melt, Valley	37.50	37.50	35.50	48.50	45.25
No. 1 Heavy Melt, Cleve.	33.50	33.50	31.50	45.50	44.25
No. 1 Heavy Melt, Buffalo	28.50	28.50	28.50	50.50	42.75
Rails, Rerolling, Chicago	54.50	54.50	54.50	61.00	52.50
No. 1 Cast, Chicago	41.50	41.50	42.50	45.50	43.00

COKE, Net Ton

Beehive, Furn., Connlsvl.	$15.25	$15.25	$15.25	$15.25	$14.75
Beehive, Fdry., Connlsvl.	18.25	18.25	18.25	18.00	17.00

Steel Prices

Mill prices as reported to STEEL, Mar. 5, cents per pound except as otherwise noted. *Changes shown in italics.* Code numbers following mill points indicate producing company. Key to producers, page 175; to footnoes, page 177.

SEMIFINISHED

INGOTS, Carbon, Forging (NT)
Munhall, Pa. U5 ..... $73.50

INGOTS, Alloy (NT)
Detroit S41 ..... $77.00
Farrell, Pa. S3 ..... 77.00
Lowellville, O. S3 ..... 77.00
Midland, Pa. C18 ..... 77.00
Munhall, Pa. U5 ..... 77.00
Sharon, Pa. S3 ..... 77.00

BILLETS, BLOOMS & SLABS
Carbon, Rerolling (NT)
Bessemer, Pa. U5 ..... $77.50
Buffalo R2 ..... 77.50
Clairton, Pa. U5 ..... 77.50
Ensley, Ala. T2 ..... 77.50
Fairfield, Ala. T2 ..... 77.50
Fontana, Calif. K1 ..... 88.00
Gary, Ind. U5 ..... 77.50
Johnstown, Pa. B3 ..... 77.50
Lackawanna, N.Y. B2 ..... 77.50
Munhall, Pa. U5 ..... 77.50
Owensboro, Ky. G8 ..... 77.50
S. Chicago, Ill. R2, U5 ..... 77.50
S. Duquesne, Pa. U5 ..... 77.50
Sterling, Ill. N15 ..... 77.50
Youngstown R2 ..... 77.50

Carbon, Forging (NT)
Bessemer, Pa. U5 ..... $96.00
Buffalo R2 ..... 96.00
Canton, O. R2 ..... 98.50
Clairton, Pa. U5 ..... 96.00
Conshohocken, Pa. A3 ..... 101.00
Ensley, Ala. T2 ..... 96.00
Fairfield, Ala. T2 ..... 96.00
Fontana, Calif. K1 ..... 105.50
Gary, Ind. U5 ..... 96.00
Geneva, Utah C11 ..... 96.00
Houston S5 ..... 101.00
Johnstown, Pa. B2 ..... 96.00
Lackawanna, N.Y. B2 ..... 96.00
LosAngeles B3 ..... 105.50
Midland, Pa. C18 ..... 96.00
Munhall, Pa. U5 ..... 96.00
Owensboro, Ky. G8 ..... 96.00
Seattle B3 ..... 109.50
Sharon, Pa. S3 ..... 96.00
S. Chicago R2, U5, W14 ..... 96.00
S. Duquesne, Pa. U5 ..... 96.00
S. SanFrancisco B3 ..... 105.50
Warren, O. C17 ..... 96.00

Alloy, Forging (NT)
Bethlehem, Pa. B2 ..... $114.00
Bridgeport, Conn. C32 ..... 114.00
Buffalo R2 ..... 114.00
Canton, O. R2, T7 ..... 114.00
Conshohocken, Pa. A3 ..... 121.00
Detroit S41 ..... 114.00
Economy, Pa. B14 ..... 114.00
Farrell, Pa. S3 ..... 114.00
Fontana, Calif. K1 ..... 135.00
Gary, Ind. U5 ..... 114.00
Houston S5 ..... 119.00
Ind. Harbor, Ind. Y1 ..... 114.00
Johnstown, Pa. B2 ..... 114.00
Lackawanna, N.Y. B2 ..... 114.00
LosAngeles B3 ..... 134.00
Lowellville, O. S3 ..... 114.00
Massillon, O. R2 ..... 114.00
Midland, Pa. C18 ..... 114.00
Munhall, Pa. U5 ..... 114.00
Owensboro, Ky. G8 ..... 114.00
Sharon, Pa. S3 ..... 114.00
S. Chicago R2, U5, W14 ..... 114.00
S. Duquesne, Pa. U5 ..... 114.00
Struthers, O. Y1 ..... 114.00
Warren, O. C17 ..... 114.00

ROUNDS, SEAMLESS TUBE (NT)
Buffalo R2 ..... $117.50
Canton, O. R2 ..... 120.00
Cleveland R2 ..... 117.50
Gary, Ind. U5 ..... 117.50
S. Chicago, Ill. R2, W14 ..... 117.50
S. Duquesne, Pa. U5 ..... 117.50
Warren, O. C17 ..... 117.50

SKELP
Aliquippa, Pa. J5 ..... 5.075
Munhall, Pa. U5 ..... 4.875
Pittsburgh J5 ..... 5.075
Warren, O. R2 ..... 4.875
Youngstown R2, U5 ..... 4.875

WIRE RODS
AlabamaCity, Ala. R2 ..... 6.15
Aliquippa, Pa. J5 ..... 6.15
Alton, Ill. L1 ..... 6.35
Buffalo W12 ..... 6.15
Cleveland A7 ..... 6.15
Donora, Pa. A7 ..... 6.15
Fairfield, Ala. T2 ..... 6.15
Houston S5 ..... 6.40
IndianaHarbor, Ind. Y1 ..... 6.15
Johnstown, Pa. B2 ..... 6.15
Joliet, Ill. A7 ..... 6.15
KansasCity, Mo. S5 ..... 6.40
Kokomo, Ind. C16 ..... 6.25
LosAngeles B3 ..... 6.95
Minnequa, Colo. C10 ..... 6.40
Monessen, Pa. P7 ..... 6.15
N. Tonawanda, N.Y. B11 ..... 6.15
Pittsburg, Calif. C11 ..... 6.95
Portsmouth, O. P12 ..... 6.15
Roebling, N.J. R5 ..... 6.25
S. Chicago, Ill. R2 ..... 6.15
SparrowsPoint, Md. B2 ..... 6.25
Sterling, Ill. (1) N15 ..... 6.15
Sterling, Ill. N15 ..... 6.25
Struthers, O. Y1 ..... 6.15
Worcester, Mass. A7 ..... 6.45

STRUCTURALS

Carbon Steel Std. Shapes
AlabamaCity, Ala. R2 ..... 5.275
Atlanta A11 ..... 5.475
Aliquippa, Pa. J5 ..... 5.275
Bessemer, Ala. T2 ..... 5.275
Bethlehem, Pa. B2 ..... 5.325
Birmingham C15 ..... 5.275
Clairton, Pa. U5 ..... 5.275
Fairfield, Ala. T2 ..... 5.275
Fontana, Calif. K1 ..... 6.075
Gary, Ind. U5 ..... 5.275
Geneva, Utah C11 ..... 5.275
Houston S5 ..... 5.375
Ind. Harbor, Ind. I-2 ..... 5.275
Johnstown, Pa. B2 ..... 5.325
Joliet, Ill. P22 ..... 5.275
KansasCity, Mo. S5 ..... 5.375
Lackawanna, N.Y. B2 ..... 5.325
LosAngeles B3 ..... 5.975
Minnequa, Colo. C10 ..... 5.575
Munhall, Pa. U5 ..... 5.275
Niles, Calif. P1 ..... 5.925
Phoenixville, Pa. P4 ..... 5.325
Portland, Oreg. O4 ..... 6.025
Seattle B3 ..... 6.025
S. Chicago, Ill. U5, W14 ..... 5.275
S. SanFrancisco B3 ..... 5.925
Sterling, Ill. N15 ..... 5.275
Torrance, Calif. C11 ..... 5.975
Weirton, W.Va. W6 ..... 5.275

Wire Flange
Bethlehem, Pa. B2 ..... 5.325
Clairton, Pa. U5 ..... 5.275
Fontana, Calif. K1 ..... 6.225
IndianaHarbor, Ind. I-2 ..... 5.275
Lackawanna, N.Y. B2 ..... 5.325
Munhall, Pa. U5 ..... 5.275
Phoenixville, Pa. P4 ..... 5.325
S. Chicago, Ill. U5 ..... 5.275

Alloy Std. Shapes
Aliquippa, Pa. J5 ..... 6.55
Clairton, Pa. U5 ..... 6.65
Gary, Ind. U5 ..... 6.65
Houston S5 ..... 6.65
KansasCity, Mo. S5 ..... 6.65
Munhall, Pa. U5 ..... 6.55
S. Chicago, Ill. U5 ..... 6.55

H.S., L.A. Std. Shapes
Aliquippa, Pa. J5 ..... 7.75
Bessemer, Ala. T2 ..... 7.75
Bethlehem, Pa. B2 ..... 7.80
Clairton, Pa. U5 ..... 7.75
Fairfield, Ala. T2 ..... 7.75
Fontana, Calif. K1 ..... 8.55
Gary, Ind. U5 ..... 7.75
Geneva, Utah C11 ..... 7.75
Houston S5 ..... 7.85
Ind. Harbor, Ind. I-2, Y1 ..... 7.75
Johnstown, Pa. B2 ..... 7.80
KansasCity, Mo. S5 ..... 7.85
Lackawanna, N.Y. B2 ..... 7.80
LosAngeles B3 ..... 9.45
Munhall, Pa. U5 ..... 7.75
Seattle B3 ..... 8.50
S. Chicago, Ill. U5, W14 ..... 7.75
S. SanFrancisco B3 ..... 8.40
Struthers, O. Y1 ..... 7.75

H.S., L.A. Wide Flange
Bethlehem, Pa. B2 ..... 7.80
Lackawanna, N.Y. B2 ..... 7.80
Munhall, Pa. U5 ..... 7.75
S. Chicago, Ill. U5 ..... 7.75

PILING

BEARING PILES
Bethlehem, Pa. B2 ..... 5.325
Lackawanna, N.Y. B2 ..... 5.325
Munhall, Pa. U5 ..... 5.275
S. Chicago, Ill. U5 ..... 5.275

STEEL SHEET PILING
Lackawanna, N.Y. B2 ..... 6.225
Munhall, Pa. U5 ..... 6.225
S. Chicago, Ill. U5 ..... 6.225
Weirton, W.Va. W6 ..... 6.225

PLATES

PLATES, Carbon Steel
AlabamaCity, Ala. R2 ..... 5.10
Aliquippa, Pa. J5 ..... 5.10
Ashland, Ky. (15) A10 ..... 5.10
Bessemer, Ala. T2 ..... 5.10
Clairton, Pa. U5 ..... 5.10
Claymont, Del. C22 ..... 5.10
Cleveland J5, R2 ..... 5.20
Coatesville, Pa. L7 ..... 5.10
Conshohocken, Pa. A3 ..... 5.20
Ecorse, Mich. G5 ..... 5.20
Fairfield, Ala. T2 ..... 5.10
Fontana, Calif. (30) K1 ..... 5.90
Gary, Ind. U5 ..... 5.10
Geneva, Utah C11 ..... 5.10
GraniteCity, Ill. G4 ..... 5.30
Harrisburg, Pa. P4 ..... 5.10
Houston S5 ..... 5.20
Ind. Harbor, Ind. I-2, Y1 ..... 5.10
Johnstown, Pa. B2 ..... 5.10
Lackawanna, N.Y. B2 ..... 5.10
LoneStar, Tex. L6 ..... 5.20
Mansfield, O. E6 ..... 5.10
Minnequa, Colo. C10 ..... 5.95
Munhall, Pa. U5 ..... 5.10
Newport, Ky. A2 ..... 5.10
Pittsburgh J5 ..... 5.10
Riverdale, Ill. A1 ..... 5.10
Seattle B3 ..... 6.00
Sharon, Pa. S3 ..... 5.10
S. Chicago, Ill. U5, W14 ..... 5.10
SparrowsPoint, Md. B2 ..... 5.10
Sterling, Ill. N15 ..... 5.10
Steubenville, O. W10 ..... 5.10
Warren, O. R2 ..... 5.10
Youngstown U5, Y1 ..... 5.10

PLATES, Carbon Abras. Resist.
Claymont, Del. C22 ..... 6.75
Fontana, Calif. K1 ..... 7.55
Geneva, Utah C11 ..... 6.75
Houston S5 ..... 6.85
Johnstown, Pa. B2 ..... 6.75
SparrowsPoint, Md. B2 ..... 6.75

PLATES, Wrought Iron
Economy, Pa. B14 ..... 13.15

PLATES, H.S., L.A.
Aliquippa, Pa. J5 ..... 7.625
Bessemer, Ala. T2 ..... 7.625
Clairton, Pa. U5 ..... 7.625
Claymont, Del. C22 ..... 7.625
Cleveland J5, R2 ..... 7.625
Coatesville, Pa. L7 ..... 7.925
Conshohocken, Pa. A3 ..... 7.625
Economy, Pa. B14 ..... 7.625
Ecorse, Mich. G5 ..... 7.725
Fairfield, Ala. T2 ..... 7.625
Farrell, Pa. S3 ..... 7.625
Fontana, Calif. (30) K1 ..... 8.425
Gary, Ind. U5 ..... 7.625
Geneva, Utah C11 ..... 7.625
Houston S5 ..... 7.725
Ind. Harbor, Ind. I-2, Y1 ..... 7.625
Johnstown, Pa. B2 ..... 7.625
Munhall, Pa. U5 ..... 7.625
Pittsburgh J5 ..... 7.625
Seattle B3 ..... 8.525
Sharon, Pa. S3 ..... 7.625
S. Chicago, Ill. U5, W14 ..... 7.625
SparrowsPoint, Md. B2 ..... 7.625
Warren, O. R2 ..... 7.625
Youngstown U5 ..... 7.625

PLATES, ALLOY
Aliquippa, Pa. J5 ..... 7.20
Claymont, Del. C22 ..... 7.20
Coatesville, Pa. L7 ..... 7.20
Economy, Pa. B14 ..... 7.20
Fontana, Calif. K1 ..... 8.00
Gary, Ind. U5 ..... 7.20
Houston S5 ..... 7.30
Ind. Harbor, Ind. Y1 ..... 7.20
Johnstown, Pa. B2 ..... 7.20
Lowellville, O. S3 ..... 7.20
Munhall, Pa. U5 ..... 7.20
Newport, Ky. A2 ..... 7.20
Pittsburgh J5 ..... 7.20
Seattle B3 ..... 8.10
Sharon, Pa. S3 ..... 7.20
S. Chicago, Ill. U5, W14 ..... 7.20
SparrowsPoint, Md. B2 ..... 7.20
Youngstown Y1 ..... 7.20

FLOOR PLATES
Cleveland J5 ..... 6.175
Conshohocken, Pa. A3 ..... 6.175
Ind. Harbor, Ind. I-2 ..... 6.175
Munhall, Pa. U5 ..... 6.175
S. Chicago, Ill. U5 ..... 6.175

PLATES, Ingot Iron
Ashland c.l. (15) A10 ..... 5.35
Ashland l.c.l. (15) A10 ..... 5.85
Cleveland c.l. R2 ..... 5.85
Warren, O. c.l. R2 ..... 5.85

BARS

BARS, Hot-Rolled Carbon (Merchant Quality)
Ala. City, Ala. (9) R2 ..... 5.425
Aliquippa, Pa. (9) J5 ..... 5.425
Alton, Ill. L1 ..... 5.625
Atlanta (9) A11 ..... 5.625
Bessemer, Ala. (9) T2 ..... 5.425
Birmingham (9) C15 ..... 5.425
Buffalo (9) R2 ..... 5.425
Clairton, Pa. (9) U5 ..... 5.425
Cleveland (9) R2 ..... 5.425
Ecorse, Mich. (9) G5 ..... 5.525
Emeryville, Calif. J7 ..... 6.175
Fairfield, Ala. (9) T2 ..... 5.425
Fairless, Pa. (9) U5 ..... 5.575
Fontana, Calif. (9) K1 ..... 6.125
Gary, Ind. (9) U5 ..... 5.425
Houston (9) S5 ..... 5.675
Ind. Harbor (9) I-2, Y1 ..... 5.425
Johnstown, Pa. (9) B2 ..... 5.425
Joliet, Ill. P22 ..... 5.425
KansasCity, Mo. (9) S5 ..... 5.675
Lackawanna (9) B2 ..... 5.425
LosAngeles (9) B3 ..... 6.125
Midland, Pa. (23) C18 ..... 5.725
Milton, Pa. M18 ..... 5.575
Minnequa, Colo. C10 ..... 5.875
Niles, Calif. P1 ..... 6.125
N. Tonawanda, N.Y. (23) B11 ..... 5.775
Owensboro, Ky. (9) G8 ..... 5.425
Pittsburgh, Calif. (9) C11 ..... 6.125
Pittsburgh (9) J5 ..... 5.425
Portland, Oreg. O4 ..... 6.175
Seattle B3, N14 ..... 6.175
S. Ch'c'go (9) R2, U5, W14 ..... 5.425
S. Duquesne, Pa. (9) U5 ..... 5.425
S. SanFran., Calif. (9) B3 ..... 6.175
Sterling, Ill. (1) (9) N15 ..... 5.425
Sterling, Ill. (9) N15 ..... 5.525
Struthers, O. (9) Y1 ..... 5.425
Tonawanda, N.Y. B12 ..... 5.425
Torrance, Calif. (9) C11 ..... 6.125
Youngstown (9) R2, U5 ..... 5.425

BARS, H.R. Leaded Alloy (Including leaded extra)
Warren, O. C17 ..... 7.475

BARS, Hot-Rolled Alloy
Aliquippa, Pa. J5 ..... 6.475
Bethlehem, Pa. B2 ..... 6.475
Bridgeport, Conn. C32 ..... 6.55
Buffalo R2 ..... 6.475
Canton, O. R2, T7 ..... 6.475
Clairton, Pa. U5 ..... 6.475
Detroit S41 ..... 6.475
Economy, Pa. B14 ..... 6.475
Ecorse, Mich. G5 ..... 6.575
Fairless, Pa. U5 ..... 6.625
Farrell, Pa. S3 ..... 6.475
Fontana, Calif. K1 ..... 7.525
Gary, Ind. U5 ..... 6.475
Houston S5 ..... 6.725
Ind. Harbor, Ind. I-2, Y1 ..... 6.475
Johnstown, Pa. B2 ..... 6.475
KansasCity, Mo. S5 ..... 6.725
Lackawanna, N.Y. B2 ..... 6.475
Lowellville, O. S3 ..... 6.475
LosAngeles B3 ..... 7.525
Massillon, O. R2 ..... 6.475
Midland, Pa. C18 ..... 6.475
Owensboro, Ky. G8 ..... 6.475
Pittsburgh J5 ..... 6.475
Sharon, Pa. S3 ..... 6.475
S. Chicago R2, U5, W14 ..... 6.475
S. Duquesne, Pa. U5 ..... 6.475
Struthers, O. Y1 ..... 6.475
Warren, O. C17 ..... 6.475
Youngstown U5 ..... 6.475

BARS & SMALL SHAPES, H.R. High-Strength, Low-Alloy
Aliquippa, Pa. J5 ..... 7.925
Bessemer, Ala. T2 ..... 7.925
Bethlehem, Pa. B2 ..... 7.925
Clairton, Pa. U5 ..... 7.925
Cleveland R2 ..... 7.925
Ecorse, Mich. G5 ..... 8.025
Fairfield, Ala. T2 ..... 7.925
Fontana, Calif. K1 ..... 8.625
Gary, Ind. U5 ..... 7.925
Houston S5 ..... 8.175
Ind. Harbor, Ind. Y1 ..... 7.925
Johnstown, Pa. B2 ..... 7.925
KansasCity, Mo. S5 ..... 8.175
Lackawanna, N.Y. B2 ..... 7.925
LosAngeles B3 ..... 8.625
Pittsburgh J5 ..... 7.925
Seattle B3 ..... 8.675
S. Chicago, Ill. U5, W14 ..... 7.925
S. Duquesne, Pa. U5 ..... 7.925
S. SanFrancisco B3 ..... 8.675
Struthers, O. Y1 ..... 7.925
Youngstown U5 ..... 7.925

BAR SIZE ANGLES; H.R. Carbon
Bethlehem, Pa. (9) B2 ..... 5.575
Houston (9) S5 ..... 5.675
KansasCity, Mo. (9) S5 ..... 5.675
Lackawanna (9) B2 ..... 5.425
Sterling, Ill. N15 ..... 5.525
Sterling, Ill. (1) N15 ..... 5.425
Tonawanda, N.Y. B12 ..... 5.425

BAR SIZE ANGLES; S. Shapes
Aliquippa, Pa. J5 ..... 5.425
Atlanta A11 ..... 5.625
Joliet, Ill. P22 ..... 5.425
Niles, Calif. P1 ..... 6.125
Pittsburgh J5 ..... 5.425
Portland, Oreg. O4 ..... 6.175
SanFrancisco S7 ..... 6.275
Seattle B3 ..... 6.175

BAR SHAPES, Hot-Rolled Alloy
Aliquippa, Pa. J5 ..... 6.55
Clairton, Pa. U5 ..... 6.55
Gary, Ind. U5 ..... 6.55
Houston S5 ..... 6.80
KansasCity, Mo. S5 ..... 6.80
Pittsburgh J5 ..... 6.55
Youngstown U5 ..... 6.55

BARS, C.F., Leaded Alloy (Including leaded extra)
Ambridge, Pa. W18 ..... 9.925
BeaverFalls, Pa. M12 ..... 9.925
Camden, N.J. P13 ..... 10.10
Chicago W18 ..... 9.925
Cleveland C20 ..... 9.925*
Elyria, O. W8 ..... 9.925
LosAngeles P2, S30 ..... 11.40*
Monaca, Pa. S17 ..... 9.925
Newark, N.J. W18 ..... 10.10
SpringCity, Pa. K3 ..... 10.10
Warren, O. C17 ..... 9.925

*Grade A; add 0.50c for Grade B.

BARS, Cold-Finished Carbon
Ambridge, Pa. W18 ..... 7.30
BeaverFalls, Pa. M12, R2 ..... 7.30
Birmingham C15 ..... 7.90
Bridgeport, Conn. C32 ..... 7.65
Buffalo B5 ..... 7.35
Camden, N.J. P13 ..... 7.75
Carnegie, Pa. C12 ..... 7.30
Chicago W18 ..... 7.30
Cleveland A7, C20 ..... 7.30
Detroit B5, P17 ..... 7.50
Detroit S41 ..... 7.30
Donora, Pa. A7 ..... 7.30
Elyria, O. W8 ..... 7.30
FranklinPark, Ill. N5 ..... 7.30
Gary, Ind. R2 ..... 7.30
GreenBay, Wis. F7 ..... 7.30
Hammond, Ind. J5, L2 ..... 7.30
Hartford, Conn. R2 ..... 7.50
Harvey, Ill. B5 ..... 7.30
LosAngeles (49) S30 ..... 8.75
LosAngeles P2, R2 ..... 8.75
Mansfield, Mass. B5 ..... 7.85
Massillon, O. R2, R8 ..... 7.30
Midland, Pa. C18 ..... 7.30
Monaca, Pa. S17 ..... 7.30
Newark, N.J. W18 ..... 7.75
NewCastle, Pa. (17) B4 ..... 7.30
Pittsburgh J5 ..... 7.30
Plymouth, Mich. P5 ..... 7.55
Putnam, Conn. W18 ..... 7.85
Readville, Mass. C14 ..... 7.85
S. Chicago, Ill. W14 ..... 7.30
SpringCity, Pa. K3 ..... 7.75
Struthers, O. Y1 ..... 7.30
Warren, O. C17 ..... 7.30
Willimantic, Conn. J5 ..... 7.80
Waukegan, Ill. A7 ..... 7.30
Youngstown F3, Y1 ..... 7.30

BARS, Cold-Finished Carbon (Turned and Ground)
Cumberland, Md. (5) C19 ..... 6.55

BARS, Cold-Finished Alloy
Ambridge, Pa. W18 ..... 8.775
BeaverFalls, Pa. M12, R2 ..... 8.775
Bethlehem, Pa. B2 ..... 8.775
Bridgeport, Conn. C32 ..... 8.925
Buffalo B5 ..... 8.775
Camden, N.J. P13 ..... 8.95
Canton, O. T7 ..... 8.775
Carnegie, Pa. C12 ..... 8.775
Chicago W18 ..... 8.775
Cleveland A7, C20 ..... 8.775
Detroit B5, P17 ..... 8.975
Detroit S41 ..... 8.775
Donora, Pa. A7 ..... 8.775
Elyria, O. W8 ..... 8.775
FranklinPark, Ill. N5 ..... 8.775
Gary, Ind. R2 ..... 8.775
GreenBay, Wis. F7 ..... 8.775
Hammond, Ind. J5, L2 ..... 8.775
Hartford, Conn. R2 ..... 9.075
Harvey, Ill. B5 ..... 8.775
Lackawanna, N.Y. B2 ..... 8.775
LosAngeles P2, S30 ..... 10.75
Mansfield, Mass. B5 ..... 9.075
Massillon, O. R2, R8 ..... 8.775
Midland, Pa. C18 ..... 8.775
Monaca, Pa. S17 ..... 8.775
Newark N.J. W18 ..... 8.95
Plymouth, Mich. P5 ..... 8.975
S. Chicago, Ill. W14 ..... 8.775
SpringCity, Pa. K3 ..... 8.95
Struthers, O. Y1 ..... 8.775
Warren, O. C17 ..... 8.775
Waukegan, Ill. A7 ..... 8.775
Willimantic, Conn. J5 ..... 9.075
Worcester, Mass. A7 ..... 9.075
Youngstown F3, Y1 ..... 8.775

BARS, Reinforcing (To Fabricators)

AlabamaCity,Ala. R2 ..5.425
Atlanta A11 .....5.625
Birmingham C15 .....5.425
Buffalo R2 .....5.425
Cleveland R2 .....5.425
Ecorse,Mich. G5 .....5.775
Emeryville,Calif. J7 ..6.175
Fairfield,Ala. T2 ....5.425
Fairless,Pa. U5 .....5.575
Fontana,Calif. K1 ....6.125
Ft.Worth,Tex.(4)(26)T4 5.875
Gary,Ind. U5 .....5.425
Houston S5 .....5.675
Ind.Harbor,Ind. I-2, Y1 5.425
Johnstown,Pa. B2 ....5.425
Joliet,Ill. P22 .....5.425
KansasCity,Mo. S5 ...5.675
Kokomo,Ind. C16 .....5.525
Lackawanna,N.Y. B2 ..5.425
LosAngeles B3 .....6.125
Milton,Pa. M18 .....5.575
Minnequa,Colo. C10 ..5.875
Niles,Calif. P1 .....6.125
Pittsburg,Calif. C11 ..6.125
Pittsburgh J5 .....5.425
Portland,Oreg. O4 ....6.175
SandSprings,Okla. S5 ..5.925
Seattle B3, N14 .....6.175
S.Chicago,Ill. R2 .....5.425
S.Duquesne,Pa. U5 ....5.425
S.SanFrancisco B3 ....6.175
SparrowsPoint,Md. B2 ..5.425
Sterling,Ill.(1) N15 ...5.425
Sterling,Ill. N15 .....5.525
Struthers,O. Y1 .....5.425
Tonawanda,N.Y. B12 ..6.00
Torrance,Calif. C11 ...6.125
Youngstown R2, U5 ..5.425

BARS, Reinforcing (Fabricated; to Consumers)

Boston B2, U8 .....7.65
Chicago U8 .....6.91
Cleveland U8 .....6.89
Houston S5 .....7.35
Johnstown,Pa. B2 ....7.08
KansasCity,Mo. S5 ....7.35
Lackawanna,N.Y. B2 ...6.85
Marion,O. P11 .....6.70
Newark,N.J. U8 .....7.55
Philadelphia U8 .....7.38
Pittsburgh J5 U8 .....7.10
SandSprings,Okla. S5 ...7.60
Seattle B3, N14 .....7.70
SparrowsPt.,Md. B2 ...7.08
St.Paul U8 .....7.92
Williamsport,Pa. S19 ...7.00

BARS, Wrought Iron

Economy,Pa.(S.R.)B14 14.45
Economy,Pa.(D.R.)B14 .18.00
Economy,(Staybolt)B14 18.45

RAIL STEEL BARS

ChicagoHts.(3) C2, I-2 .5.325
ChicagoHts.(4)(44) I-2 .5.425
ChicagoHts.(4) C2 ....5.425
Franklin,Pa. (3) F5 ..5.325
Franklin,Pa. (4) F5 ..5.425
JerseyShore,Pa.(3) J8 ..5.30
Marion,O. (3) P11 ....5.325
Tonawanda(3) B12 ...5.325
Tonawanda(4) B12 ....6.00
Williamsport,Pa.(3) S19 5.50

SHEETS

SHEETS, Hot-Rolled Steel (18 Gage and Heavier)

AlabamaCity,Ala. R2 ..4.925
Allenport,Pa. P7 .....4.925
Ashland,Ky.(8) A10 ..4.925
Cleveland J5, R2 .....4.925
Conshohocken,Pa. A3 ..4.975
Detroit(8) M1 .....5.025
Ecorse,Mich. G5 .....5.025
Fairfield,Ala. T2 ....4.925
Fairless,Pa. U5 .....4.975
Fontana,Calif. K1 ....5.675
Gary,Ind. U5 .....4.925
Geneva,Utah C11 .....5.025
GraniteCity,Ill(8) G4 ..5.125
Ind.Harbor,Ind. I-2, Y1 4.925
Irvin,Pa. U5 .....4.925
Lackawanna,N.Y. B2 ..4.925
Mansfield,O. E6 .....4.925
Munhall,Pa. U5 .....4.925
Newport,Ky.(8) A2 ..4.925
Niles,O. M21, S3 .....4.925
Pittsburg,Calif. C11 ..5.625
Pittsburgh J5 .....4.925
Portsmouth,O. P12 ....4.925
Riverdale,Ill. A1 .....4.925
Sharon,Pa. S3 .....4.925
S.Chicago,Ill. W14 ....4.925
SparrowsPoint,Md. B2 ..4.925
Steubenville,O. W10 ..4.925
Warren,O. R2 .....4.925
Weirton,W.Va. W6 ...4.925
Youngstown U5, Y1 ..4.925

SHEETS, H.R.(19) Ga. & Lighter)

Niles,O. M21 .....6.05

SHEETS, H.R. Alloy

Gary,Ind. U5 .....8.10
Ind.Harbor,Ind. Y1 ....8.10
Irvin,Pa. U5 .....8.10
Munhall,Pa. U5 .....8.10
Newport,Ky. A2 .....8.10
Youngstown U5, Y1 ...8.10

SHEETS, H.R.(14 Ga. & Heavier) High-Strength, Low-Alloy

Cleveland J5, R2 ....7.275
Conshohocken,Pa. A3 ..7.325
Ecorse,Mich. G5 .....7.375
Fairfield,Ala. T2 ....7.275
Fairless,Pa. U5 .....7.325
Farrell,Pa. S3 .....7.275
Fontana,Calif. K1 ....8.025
Gary,Ind. U5 .....7.275
Ind.Harbor,Ind. I-2, Y1 7.275
Irvin,Pa. U5 .....7.275
Lackawanna (35) B2 ..7.275
Munhall,Pa. U5 .....7.275
Pittsburgh J5 .....7.275
S.Chicago,Ill. U5, W14 7.275
Sharon,Pa. S3 .....7.275
SparrowsPoint(36) B2 ..7.275
Warren,O. R2 .....7.275
Weirton,W.Va. W6 ...7.275
Youngstown U5, Y1 ..7.275

SHEETS, Hot-Rolled Ingot Iron (18 Gage and Heavier)

Ashland,Ky.(8) A10 ..5.175
Cleveland R2 .....5.675
Warren,O. R2 .....5.675

SHEETS, Cold-Rolled Ingot Iron

Cleveland R2 .....6.80
Middletown,O. A10 ....6.55
Warren,O. R2 .....6.80

SHEETS, Cold-Rolled Steel (Commercial Quality)

AlabamaCity,Ala. R2 ..6.05
Allenport,Pa. P7 .....6.05
Cleveland J5, R2 .....6.05
Conshohocken,Pa. A3 ..6.10
Detroit M1 .....6.05
Ecorse,Mich. G5 .....6.15
Fairfield,Ala. T2 .....6.05
Fairless,Pa. U5 .....6.10
Follansbee,W.Va. F4 ..6.05
Fontana,Calif. K1 ....7.30
Gary,Ind. U5 .....6.05
GraniteCity,Ill. G4 ....6.25
Ind.Harbor,Ind. I-2, Y1 6.05
Irvin,Pa. U5 .....6.05
Lackawanna,N.Y. B2 ..6.05
Mansfield,O. E6 .....6.05
Middletown,O. A10 ....6.05
Newport,Ky. A2 .....6.05
Pittsburg,Calif. C11 ....7.00
Pittsburgh J5 .....6.05
Portsmouth,O. P12 ....6.05
SparrowsPoint,Md. B2 ..6.05
Steubenville,O. W10 ....6.05
Warren,O. R2 .....6.05
Weirton,W.Va. W6 ....6.05
Yorkville,O. W10 .....6.05
Youngstown Y1 .....6.05

SHEETS, Cold-Rolled High-Strength, Low-Alloy

Cleveland J5, R2 ....8.975
Ecorse,Mich. G5 .....9.075
Fairless,Pa. U5 .....9.025
Fontana,Calif. K1 ....10.275
Gary,Ind. U5 .....8.975
IndianaHarbor,Ind. Y1 8.975
Irvin,Pa. U5 .....8.975
Lackawanna(37) B2 ..8.975
Pittsburgh J5 .....8.975
SparrowsPoint (38) B2 8.975
Warren,O. R2 .....8.975
Weirton,W.Va. W6 ...8.975
Youngstown Y1 .....8.975

SHEETS, Culvert

	Cu Steel	Cu Fe
Ashland,Ky. A10	.6.95	7.20
Canton,O. R2	....6.95	7.45
Fairfield T2	....6.95	7.20
Gary,Ind. U5	....6.95	7.20
GraniteCity,Ill. G4	7.15	...
Ind.Harbor I-2	..6.95	7.20
Irvin,Pa. U5	....6.95	7.20
Kokomo,Ind. C16	.7.05	...
MartinsFry. W10	.6.95	7.20
Pitts.,Calif. C11	..7.70	...
Pittsburgh J5	....6.95	...
SparrowsPt. B2	..6.95	...

SHEETS, Culvert—Pure Iron

Ind.Harbor,Ind. I-2 ..7.20

SHEETS, Galvanized Steel Hot-Dipped

AlabamaCity,Ala. R2 ..6.60‡
Ashland,Ky. A10 ....6.60†
Canton,O. R2 .....6.60†
Dover,O. E6 .....6.60†
Fairfield,Ala. T2 .....6.60†
Gary,Ind. U5 .....6.60†
GraniteCity,Ill. G4 ....6.80*
Ind.Harbor,Ind. I-2 ..6.60†
Irvin,Pa. U5 .....6.60†
Kokomo,Ind. C16 ....6.70‡
MartinsFerry,O. W10 ..6.60*
Middletown,O. A10 ....6.60†
Pittsburg,Calif. C11 ...7.35*
Pittsburgh J5 .....6.60†
SparrowsPt.,Md. B2 ..6.60†
Warren,O. R2 .....6.60†
Weirton,W.Va. W6 ....6.60*

*Continuous and noncontinuous .†Continuous. ‡Noncontinuous.

SHEETS, Well Casing

Fontana, Calif. K1 ....7.175

SHEETS, Galvanized High-Strength, Low-Alloy

Irvin,Pa. U5 .....9.725
SparrowsPt.(39) B2 ..9.725

SHEETS, Galvannealed Steel

Canton,O. R2 .....7.00
Irvin,Pa. U5 .....7.00

SHEETS, Galvanized Ingot Iron (Hot-Dipped Continuous)

Ashland,Ky. A10 .....6.85
Middletown,O. A10 ....6.85

SHEETS, Electrogalvanized

Cleveland (28) R2 ....7.425
Niles,O. (28) R2 .....7.425
Youngstown J5 .....7.275
Weirton,W.Va. W6 ...7.275

SHEETS, Aluminum Coated

Butler,Pa. A10 (type 1) .9.25
Butler,Pa. A10 (type 2) .9.35

SHEETS, Enameling Iron

Ashland,Ky. A10 .....6.625
Cleveland R2 .....6.625
Fairfield,Ala. T2 .....6.625
Gary,Ind. U5 .....6.625
GraniteCity,Ill. G4 ....6.825
Ind.Harbor,Ind. I-2, Y1 6.625
Irvin,Pa. U5 .....6.625
Middletown,O. A10 ....6.625
Niles,O. M21, S3 ....6.625
Youngstown Y1 .....6.625

BLUED STOCK, 29 Gage

Follansbee,W.Va. F4 ..8.65
Ind.Harbor,Ind. I-2 ..8.475
Yorkville,O. W10 ....8.475

SHEETS, Long Terne Steel (Commercial Quality)

BeechBottom,W.Va.W10 7.00
Gary,Ind. U5 .....7.00
Mansfield,O. E6 .....7.00
Middletown,O. A10 ....7.00
Niles,O. M21, R2, S3....7.00
Weirton,W.VA. W6 ....7.00

SHEETS, Long Terne, Ingot Iron

Middletown,O. A10 ....7.40

Key To Producers

A1 Acme Steel Co.
A2 Acme-Newport Steel Co.
A3 Alan Wood Steel Co.
A4 Allengheny Ludlum Steel
A5 Alloy Metal Wire Div., H. K. Porter Co. Inc.
A6 American Shim Steel Co.
A7 American Steel & Wire Div., U. S. Steel Corp.
A8 Anchor Drawn Steel Co.
A9 Angell Nail & Chaplet
A10 Armco Steel Corp.
A11 Atlantic Steel Co.

B1 Babcock & Wilcox Co.
B2 Bethlehem Steel Co.
B3 Beth. Pac. Coast Steel
B4 Blair Strip Steel Co.
B5 Bliss & Laughlin Inc.
B8 Braeburn Alloy Steel
B9 Brainard Steel Div., Sharon Steel Corp.
B10 E. & G. Brooke, Wickwire Spencer Steel Div., Colo. Fuel & Iron
B11 Buffalo Bolt Co., Div., Buffalo Eclipse Corp.
B12 Buffalo Steel Corp.
B14 A. M. Byers Co.
B15 J. Bishop & Co.

C1 Calstrip Steel Corp.
C2 Calumet Steel Div., Borg-Warner Corp.
C4 Carpenter Steel Co.
C9 Colonial Steel Co.
C10 Colorado Fuel & Iron
C11 Columbia-Geneva Steel
C12 Columbia Steel & Shaft.
C13 Columbia Tool Steel Co.
C14 Compressed Steel Shaft.
C15 Connors Steel Div., H. K. Porter Co. Inc.
C16 Continental Steel Corp.
C17 Copperweld Steel Co.
C18 Crucible Steel Co.
C19 Cumberland Steel Co.
C20 Cuyahoga Steel & Wire
C22 Claymont Plant, Wickwire Spencer Steel Div., Colo. Fuel & Iron
C23 Charter Wire Inc.
C24 G. O. Carlson Inc.
C32 Carpenter Steel of N.Eng.

D2 Detroit Steel Corp.
D3 Dearborn Div., Sharon Steel Corp.
D4 Disston Div., H. K. Porter Co. Inc.
D6 Driver-Harris Co.
D7 Dickson Weatherproof Nail Co.
D8 Damascus Tube Co.
D9 Wilbur B. Driver Co.

E1 Eastern Gas & Fuel Assoc.
E2 Eastern Stainless Steel
E4 Electro Metallurgical Co.
E5 Elliott Bros. Steel Co.
E6 Empire-Reeves Steel Corp.

F2 Firth Sterling Inc.
F3 Fitzsimmons Steel Co.
F4 Follansbee Steel Corp.
F5 Franklin Steel Div., Borg-Warner Corp.
F6 Fretz-Moon Tube Co.
F7 Ft. Howard Steel & Wire
F8 Ft. Wayne Metals Inc.

G4 Granite City Steel Co.
G5 Great Lakes Steel Corp.
G6 Greer Steel Co.
G8 Green River Steel Corp.

H1 Hanna Furnace Corp.
H7 Helical Tube Co.

I-1 Igoe Bros. Inc.
I-2 Inland Steel Co.
I-3 Interlake Iron Corp.
I-4 Ingersoll Steel Div., Borg-Warner Corp.
I-6 Ivins Steel Tube Works
I-7 Indiana Steel & Wire Co.

J1 Jackson Iron & Steel Co.
J3 Jessop Steel Co.
J4 Johnson Steel & Wire Co.
J5 Jones & Laughlin Steel
J6 Joslyn Mfg. & Supply
J7 Judson Steel Corp.
J8 Jersey Shore Steel Co.

K1 Kaiser Steel Corp.
K2 Keokuk Electro-Metals
K3 Keystone Drawn Steel
K4 Keystone Steel & Wire
K7 Kenmore Metals Corp.

L1 Laclede Steel Co.
L2 LaSalle Steel Co.
L3 Latrobe Steel Co.
L6 Lone Star Steel Co.
L7 Lukens Steel Co.

M1 McLouth Steel Corp.
M4 Mahoning Valley Steel
M6 Mercer Pipe Div., Sawhill Tubular Products
M8 Mid-States Steel & Wire
M12 Moltrup Steel Products
M14 McInnes Steel Co.
M16 Md.Fine & Special Wire
M17 Metal Forming Corp.
M18 Milton Steel Div., Merritt-Chapman&Scott
M21 Mallory-Sharon Metals Corp.
M22 Mill Strip Products Co.

N1 National-Standard Co.
N2 National Supply Co.
N3 National Tube Div., U. S. Steel Corp.
N5 Nelsen Steel & Wire Co.
N6 New England High Carbon Wire Co.
N8 Newman-Crosby Steel
N9 Newport Steel Corp.
N14 Northwest. Steel Rolling Mills Inc.
N15 Northwestern S.&W.Co.
N20 Neville Ferroalloy Co.

O4 Oregon Steel Mills

P1 Pacific States Steel Corp.
P2 Pacific Tube Co.
P4 Phoenix Iron & Steel Co., Sub. of Barium Steel Corp.
P5 Pilgrim Drawn Steel
P6 Pittsburgh Coke & Chem.
P7 Pittsburgh Steel Co.
P11 Pollak Steel Co.
P12 Portsmouth Div., Detroit Steel Corp.
P13 Precision Drawn Steel
P14 Pitts. Screw & Bolt Co.
P15 Pittsburgh MetalIurgical
P16 Page Steel & Wire Div., Amer. Chain & Cable
P17 Plymouth Steel Corp.
P19 Pitts. Rolling Mills
P20 Prod. Steel Strip Corp.
P22 Phoenix Mfg. Co.
P24 Phil. Steel & Wire Corp.

R2 Republic Steel Corp.
R3 Rhode Island Steel Corp.
R5 Roebling's Sons, John A.
R6 Rome Strip Steel Co.
R8 Reliance Div., Eaton Mfg.
R9 Rome Mfg. Co.
R10 Rodney Metals Inc.

S1 Seneca Wire & Mfg. Co.
S3 Sharon Steel Corp.
S4 Sharon Tube Co.
S5 Sheffield Div., Armco Steel Corp.
S6 Shenango Furnace Co.
S7 Simmons Co.
S8 Simonds Saw & Steel Co.
S12 Spencer Wire Corp.
S13 Standard Forgings Corp.
S14 Standard Tube Co.
S15 Stanley Works
S17 Superior Drawn Steel Co.
S18 Superior Steel Div., Copperweld Steel Co.
S19 Sweet's Steel Co.
S20 Southern States Steel
S23 Superior Tube Co.
S25 Stainless Welded Prod.
S26 Specialty Wire Co. Inc.
S30 Sierra Drawn Steel Corp.
S40 Seneca Steel Service
S41 Stainless Steel Div., J&L Steel Corp.
S42 Southern Elec. Steel Co.
T2 Tenn. Coal & Iron Div., U. S. Steel Corp.
T3 Tenn. Products & Chemical Corp.
T4 Texas Steel Co.
T5 Thomas Strip Div., Pittsburgh Steel Co.
T6 Thompson Wire Co.
T7 Timken Roller Bearing
T9 Tonawanda Iron Div., Am. Rad. & Stan. San.
T13 Tube Methods Inc.
T19 Techalloy Co. Inc.

U4 Universal-Cyclops Steel
U5 United States Steel Corp.
U6 U. S. Pipe & Foundry
U7 Ulbrich Stainless Steels
U8 U. S. Steel Supply Div., U. S. Steel Corp.

V2 Vanadium-Alloys Steel
V3 Vulcan Crucible Steel Div., H. K. Porter Co.

W1 Wallace Barnes Co.
W2 Wallingford Steel Co.
W3 Washburn Wire Co.
W4 Washington Steel Corp.
W6 Weirton Steel Co.
W8 Western Automatic Machine Screw Co.
W9 Wheatland Tube Co.
W10 Wheeling Steel Corp.
W12 Wickwire Spencer Steel Div., Colo. Fuel & Iron
W13 Wilson Steel & Wire Co.
W14 Wisconsin Steel Div., International Harvester
W15 Woodward Iron Co.
W18 Wyckoff Steel Co.

Y1 Youngstown Sheet & Tube

STRIP

STRIP, Hot-Rolled Carbon

Ala.City,Ala.(27) R2	4.925
Allenport,Pa. P7	4.925
Alton,Ill. L1	5.125
Ashland,Ky.(8) A10	4.925
Atlanta A11	5.125
Bessemer,Ala. T2	4.925
Birmingham C15	4.925
Buffalo(27) R2	4.925
Conshohocken,Pa. A3	4.975
Detroit M1	5.025
Ecorse,Mich. G5	5.025
Fairfield,Ala. T2	4.925
Fontana,Calif. K1	5.675
Gary,Ind. U5	4.925
Ind.Harbor,Ind. I-2, Y1	4.925
Johnstown,Pa.(25) B2	4.925
Lackaw'na,N.Y.(25) B2	4.925
LosAngeles(25) B3	5.675
Minnequa,Colo. C10	6.025
Riverdale,Ill. A1	4.925
SanFrancisco S7	6.35
Seattle(25) B3	5.925
Seattle N14	6.35
Sharon,Pa. S3	4.925
S.Chicago W14	4.925
S.SanFrancisco(25) B3	5.675
SparrowsPoint,Md. B2	4.925
Sterling,Ill.(1) N15	4.925
Sterling,Ill. N15	5.025
Torrance,Calif. C11	5.675
Warren,O. R2	4.925
Weirton,W.Va. W6	4.925
Youngstown U5	4.925

STRIP, Hot-Rolled Alloy

Carnegie,Pa. S18	8.10
Farrell,Pa. S3	8.10
Gary,Ind. U5	8.10
Houston S5	8.35
Ind.Harbor,Ind. Y1	8.10
KansasCity,Mo. S5	8.35
LosAngeles B3	9.30
Lowellville,O. S3	8.10
Newport,Ky. A2	8.10
Sharon,Pa. A2, S3	8.10
S.Chicago,Ill. W14	8.10
Youngstown U5, Y1	8.10

STRIP, Hot-Rolled High-Strength, Low-Alloy

Bessemer,Ala. T2	7.325
Conshohocken,Pa. A3	7.325
Ecorse,Mich. G5	7.425
Fairfield,Ala. T2	7.325
Farrell,Pa. S3	7.325
Gary,Ind. U5	7.325
Ind.Harbor,Ind. I-2, Y1	7.325
Lackawanna,N.Y. B2	7.325
LosAngeles(25) B3	8.075
Seattle(25) B3	8.325
Sharon,Pa. S3	7.325
S.Chicago,Ill. W14	7.325
S.SanFrancisco(25) B3	8.075
SparrowsPoint,Md. B2	7.325
Warren,O. R2	7.325
Weirton,W.Va. W6	7.325
Youngstown U5, Y1	7.325

STRIP, Hot-Rolled Ingot Iron

Ashland,Ky.(8) A10	5.175
Warren,O. R2	5.675

STRIP, Cold-Rolled Carbon

Anderson,Ind. G6	7.15
Baltimore T6	7.15
Boston T6	7.70
Buffalo S40	7.15
Cleveland A7, J5	7.15
Conshohocken,Pa. A3	7.20
Dearborn,Mich. D3	7.25
Detroit D2, M1, P20	7.25
Dover,O. G6	7.15
Ecorse,Mich. G5	7.25
Evanston,Ill. M22	7.25
Follansbee,W.Va. F4	7.15
Fontana,Calif. K1	9.00
FranklinPark,Ill. T6	7.25
Ind.Harbor,Ind. Y1	7.15
Indianapolis J5	7.30
LosAngeles J5	9.05
LosAngeles C1	9.20
NewBedford,Mass. R10	7.60
NewBritain(10) S15	7.15
NewCastle,Pa. B4, E5	7.15
NewHaven,Conn. D2	7.60
NewKensington,Pa. A6	7.15
Pawtucket,R.I. R3	7.80
Pawtucket,R.I. N8	7.70
Philadelphia P24	7.70
Pittsburgh J5	7.15
Riverdale,Ill. A1	7.25
Rome,N.Y.(32) R6	7.15
Sharon,Pa. S3	7.15
Trenton,N.J.(31) R5	8.60
Wallingford,Conn. W2	7.60
Warren,O. R2, T5	7.15
Weirton,W.Va. W6	7.15
Worcester,Mass. A7	7.70
Youngstown J5, Y1	7.15

STRIP, Cold-Rolled Alloy

Boston T6	15.40
Carnegie,Pa. S18	15.05
Cleveland A7	15.05
Dover,O. G6	15.05
Farrell,Pa. S3	15.05
FranklinPark,Ill. T6	15.05
Harrison,N.J. C18	15.05
Indianapolis J5	15.20
Lowellville,O. S3	15.05
Pawtucket,R.I. N8	15.40
Riverdale,Ill. A1	15.05
Sharon,Pa. S3	15.05
Worcester,Mass. A7	15.35
Youngstown J5	15.05

STRIP, Cold-Rolled High-Strength, Low-Alloy

Cleveland A7	10.45
Dearborn,Mich. D3	10.60
Dover,O. G6	10.45
Ecorse,Mich. G5	10.60
Farrell,Pa. S3	10.50
Ind.Harbor,Ind. Y1	10.65
Sharon,Pa. S3	10.50
Warren,O. R2	10.45

STRIP, Cold-Finished Spring Steel (Annealed)	0.26-0.40C	0.41-0.60C	0.61-0.80C	0.81-1.05C	1.06-1.35C
Baltimore T6	9.50	10.70	12.90	15.90	18.85
Boston T6	9.50	10.70	12.90	15.90	18.85
Bristol,Conn. W1	...	10.70	12.90	16.10	19.30
Carnegie,Pa. S18	8.95	10.40	12.60	15.60	....
Cleveland A7	8.95	10.40	12.60	15.60	18.55
Dearborn,Mich. D3	9.05	10.50	12.70	....	....
Detroit D2	9.05	10.50	12.70	15.70	....
Dover,O. G6	8.95	10.40	12.60	15.60	18.55
Evanston,Ill. M22	8.95	10.40	12.60	15.60	....
Fostoria,O. S1	10.05	10.40	12.60	15.60	....
FranklinPark,Ill. T6	9.05	10.40	12.60	15.60	18.55
Harrison,N.J. C18	...	...	12.90	16.10	19.30
Indianapolis J5	9.10	10.55	12.60	15.60	18.55
LosAngeles C1	11.15	12.60	14.80	17.80	....
LosAngeles J5	11.15	12.60	14.80	....	....
NewBritain,Conn.(10) S15	8.95	10.40	12.60	15.60	18.55
NewCastle,Pa. B4, E5	8.95	10.40	12.60	15.60	....
NewHaven,Conn. D2	9.40	10.70	12.90	15.90	....
NewKensington,Pa. A6	8.95	10.40	12.60	15.60	....
New York W3	...	10.70	12.90	16.10	19.30
Pawtucket,R.I. N8	9.50	10.70	12.90	15.90	18.85
Riverdale,Ill. A1	9.05	10.40	12.60	15.60	18.55
Rome,N.Y.(32) R6	8.95	10.40	12.60	15.60	18.55
Sharon,Pa. S3	8.95	10.40	12.60	15.60	18.55
Trenton,N.J. R5	...	10.70	12.90	16.10	19.30
Wallingford,Conn. W2	9.40	10.70	12.90	15.90	18.75
Warren,O. T5	8.95	10.40	12.60	15.60	18.55
Worcester,Mass. A7, T6	9.50	10.70	12.90	15.90	18.85
Youngstown J5	8.95	10.40	12.60	15.60	18.55

Spring Steel (Tempered)	Up to 0.80C	0.81-1.05C	1.06-1.35C
Bristol,Conn. W1	18.10	21.95	26.30
Buffalo W12	18.10	....	....
Fostoria,O. S1	18.30	22.15	....
FranklinPark,Ill. T6	18.45	22.30	26.65
Harrison,N.J. C18	18.10	21.95	26.30
New York W3	18.10	21.95	26.30
Palmer,Mass. W12	18.10	....	....
Trenton,N.J. R5	18.10	21.95	26.30
Worcester,Mass. A7, T6	18.10	21.95	26.30
Youngstown J5	18.45	22.30	26.65

STRIP, Galvanized (Continuous)	
Sharon,Pa. S3	7.275

TIGHT COOPERAGE HOOP

Atlanta A11	5.65
Riverdale,Ill. A1	5.50
Sharon,Pa. S3	5.35
Youngstown U5	5.35

STRIP, Cold-Rolled Ingot Iron	
Warren,O. R2	7.90

STRIP, C.R. Electrogalvanized

Cleveland A7	7.15*
Dover,O. G6	7.15*
Evanston,Ill. M22	7.25*
Riverdale,Ill. A1	7.25*
Warren,O. B9, T5	7.15*
Worcester,Mass. A7	7.70*
Youngstown J5	7.15*

*Plus galvanizing extras.

SILICON STEEL

H.R.SHEETS(22 Ga., cut lengths)	Field	Armature	Electric	Motor	Dynamo
BeechBottom,W.Va. W10	....	....	11.80	12.90	13.95
Mansfield,O. E6	9.625	11.10	11.80	12.90	13.95
Newport,Ky. A2	9.625	11.10	11.80	12.90	13.95
Niles,O. M21, S3	9.625	11.10	11.80	12.90	....
Vandergrift,Pa. U5	....	11.10	11.80	12.90	13.95
Warren,O. R2	9.625	11.10	11.80	12.90	....
Zanesville,O. A10	....	11.10	11.80	12.90	13.95

C.R. COILS & CUT LENGTHS (22 Ga.) Fully Processed (Semiprocessed ½c lower)	Field	Armature	Electric	Motor	Dynamo
BeechBottom,W.Va. W10	....	11.35	12.05	13.15	14.20
Brackenridge,Pa. A4	....	....	12.05	13.15	14.20
GraniteCity,Ill. G4	9.825*	11.05*	11.75*	12.85*	....
IndianaHarbor,Ind. I-2	9.625†	10.85*	11.55*	12.65*	....
Mansfield,O. E6	9.625*	11.35	12.05	13.15	14.20
Vandergrift,Pa. U5	9.625*	11.35	12.05	13.15	14.20
Warren,O. R2	9.625*	11.35	12.05	13.15	14.20
Zanesville,O. A10	....	11.35†	12.05	13.15	14.20
					Stator
Vandergrift,Pa. U5	....	....	....	....	7.85

H.R. SHEETS (22 Ga., cut lengths)	T-72	T-65	T-58	T-52
BeechBottom,W.Va. W10	15.00	15.55	16.05	17.10
Vandergrift,Pa. U5	15.00	15.55	16.05	17.10
Zanesville,O. A10	15.00	15.55	16.05	17.10

C.R. COILS & CUT LENGTHS (22 Ga.)	Grain Oriented T-100	T-90	T-80	T-73	T-66	T-72
Brackenridge,Pa. A4	....	17.60	19.20	19.70	20.20	15.25††
Butler,Pa. A10	....	....	19.20	19.70	20.20	....
Vandergrift,Pa. U5	16.60	17.60	19.20	19.70	20.20	15.25**
Warren,O. R2	....	....	....	....	....	15.25‡

*Semiprocessed. †Fully processed only. ‡Coils, annealed, semiprocessed ½c lower. **Cut lengths, ¾-cent lower. ††Coils only.

TIN MILL PRODUCTS

TIN PLATE, Electrolytic (Base Box)	0.25 lb	0.50 lb	0.75 lb
Aliquippa,Pa. J5	$8.75	$9.00	$9.40
Fairfield,Ala. T2	8.85	9.10	9.50
Fairless,Pa. U5	8.85	9.10	9.50
Fontana,Calif. K1	9.50	9.75	10.15
Gary,Ind. U5	8.75	9.00	9.40
GraniteCity,Ill. G4	8.85	9.10	9.50
IndianaHarbor,Ind. I-2, Y1	8.75	9.00	9.40
Irvin,Pa. U5	8.75	9.00	9.40
Niles,O. R2	8.75	9.00	9.40
Pittsburg,Calif. C11	9.50	9.75	10.15
SparrowsPoint,Md. B2	8.85	9.10	9.50
Weirton,W.Va. W6	8.75	9.00	9.40
Yorkville,O. W10	8.75	9.00	9.40

ELECTROTIN (22-27 Gage; Dollars per 100 lb)			
Aliquippa,Pa. J5	7.725	7.925	....
Niles,O. R2	7.725	7.925	8.125

TIN PLATE, American	1.25 lb	1.50 lb
Aliquippa,Pa. J5	$10.05	$10.30
Fairfield,Ala. T2	10.15	10.40
Fairless,Pa. U5	10.15	10.40
Fontana,Calif. K1	10.80	11.05
Gary,Ind. U5	10.05	10.30
Ind.Harb. Y1	10.05	10.30
Pitts.,Calif. C11	10.80	11.05
Sp.Pt.,Md. B2	10.15	10.40
Weirton,W.Va. W6	10.05	10.30
Yorkville,O. W10	10.05	10.30

BLACK PLATE (Base Box)	
Aliquippa,Pa. J5	$7.85
Fairfield,Ala. T2	7.95
Fairless,Pa. U5	7.95
Fontana,Calif. K1	8.60
Gary,Ind. U5	7.85
GraniteCity,Ill. G4	7.95
Ind.Harbor,Ind. I-2,Y1	7.85
Irvin,Pa. U5	7.85

HOLLOWARE ENAMELING Black Plate (29 Gage)	
Aliquippa,Pa. J5	$7.50
Gary,Ind. U5	7.50
GraniteCity,Ill. G4	7.60
Ind.Harbor,Ind. Y1	7.50
Irvin,Pa. U5	7.50
Yorkville,O. W10	7.50

MANUFACTURING TERNES (Special Coated, Base Box)	
Gary,Ind. U5	$9.70
Irvin,Pa. U5	9.70

ROOFING SHORT TERNES (8 lb Coated, Base Box)	
Gary,Ind. U5	$11.25

Niles,O. R2	7.85
Pittsburg,Calif. C11	8.60
SparrowsPoint,Md. B2	7.95
Weirton,W.Va. W6	7.85
Yorkville,O. W10	7.85

WIRE

WIRE, Manufacturers Bright, Low Carbon

AlabamaCity,Ala. R2	7.65
Aliquippa,Pa. J5	7.65
Alton,Ill. L1	7.85
Atlanta A11	7.85
Bartonville,Ill. K4	7.75
Buffalo W12	7.65
Chicago W13	7.65
Cleveland A7, C20	7.65
Crawfordsville,Ind. M8	7.75
Donora,Pa. A7	7.65
Duluth A7	7.65
Fairfield,Ala. T2	7.65
Fostoria,O.(24) S1	7.75
Houston S5	7.90
Jacksonville,Fla. M8	8.00
Johnstown,Pa. B2	7.65
Joliet,Ill. A7	7.65
KansasCity,Mo. S5	7.90
Kokomo,Ind. C16	7.75
LosAngeles B3	8.60
Minnequa,Colo. C10	7.90
Monessen,Pa. P7, P16	7.65
N.Tonawanda,N.Y. B11	7.65
Palmer,Mass. W12	7.95
Pittsburg,Calif. C11	8.60
Portsmouth,O. P12	7.65
Rankin,Pa. A7	7.65
S.Chicago,Ill. R2	7.65
S.SanFrancisco C10	8.60
SparrowsPoint,Md. B2	7.75
Sterling,Ill.(1) N15	7.65
Sterling,Ill. N15	7.75
Struthers,O. Y1	7.65
Waukegan,Ill. A7	7.65
Worcester,Mass. A7	7.95

WIRE, Gal'd ACSR for Cores

Bartonville,Ill. K4	12.65
Buffalo W12	12.65
Cleveland A7	12.65
Donora,Pa. A7	12.65
Duluth A7	12.65
Johnstown,Pa. B2	12.65
Minnequa,Colo. C10	12.775
Monessen,Pa. P16	12.65
Muncie,Ind. I-7	12.85
NewHaven,Conn. A7	12.95
Palmer,Mass. W12	12.95
Pittsburg,Calif. C11	13.45
Portsmouth,O. P12	12.65
Roebling,N.J. R5	12.95
SparrowsPt.,Md. B2	12.75
Struthers,O. Y1	12.65
Trenton,N.J. A7	12.95
Waukegan,Ill. A7	12.65
Worcester,Mass. A7	12.95

WIRE, Upholstery Spring

Aliquippa,Pa. J5	9.30
Alton,Ill. L1	9.50
Buffalo W12	9.30
Cleveland A7	9.30
Donora,Pa. A7	9.30
Duluth A7	9.30
Johnstown,Pa. B2	9.30
KansasCity,Mo. S5	9.55
LosAngeles B3	10.25
Minnequa,Colo. C10	9.50
Monessen,Pa. P7, P16	9.30
NewHaven,Conn. A7	9.60
Palmer,Mass. W12	9.60
Pittsburg,Calif. C11	10.25
Portsmouth,O. P12	9.30
Roebling,N.J. R5	9.60
S.Chicago,Ill. R2	9.30
S.SanFrancisco C10	10.25
SparrowsPt.,Md. B2	9.40
Struthers,O. Y1	9.30
Trenton,N.J. A7	9.60
Waukegan,Ill. A7	9.30
Worcester,Mass. A7, J4, T6	9.60

WIRE, Fine & Weaving (8" Coils)

Alton,Ill. L1	15.80
Bartonville,Ill. K4	15.70
Buffalo W12	15.60
Chicago W13	15.60
Cleveland A7	15.60
Crawfordsville,Ind. M8	15.70
Fostoria,O. S1	15.60
Houston S5	15.85
Jacksonville,Fla. M8	15.95
Johnstown,Pa. B2	15.60
KansasCity,Mo. S5	15.85
Kokomo,Ind. C16	15.60
Minnequa,Colo. C10	15.85
Monessen,Pa. P7, P16	15.60
Muncie,Ind. I-7	15.80
Palmer,Mass. W12	15.90
S.SanFrancisco C10	16.45
Waukegan,Ill. A7	15.60
Worcester,Mass. A7, T6	15.90

ROPE WIRE	(A)
Bartonville,Ill. K4	12.75
Buffalo W12	12.75
Fostoria,O. S1	12.75
Johnstown,Pa. B2	12.75
Monessen,Pa. P7	12.75
Muncie,Ind. I-7	12.95
Palmer,Mass. W12	13.05
Portsmouth,O. P12	12.75
Roebling,N.J. R5	13.05
SparrowsPt.,Md. B2	12.85
Struthers,O. Y1	12.75
Worcester,Mass. J4	13.05

(A) Plow and Mild Plow: add 0.25c for Improved Plow

WIRE, Tire Bead

Bartonville,Ill. K4	16.55
Monessen,Pa. P16	16.55
Roebling,N.J. R5	17.05

WIRE, Cold-Rolled Flat

Anderson,Ind. G6	11.65
Baltimore T6	11.95
Boston T6	11.95
Buffalo W12	11.65
Chicago W13	11.75
Cleveland A7	11.65
Crawfordsville,Ind. M8	11.65
Dover,O. G6	11.65
Fostoria,O. S1	11.65
FranklinPark,Ill. T6	11.75
Kokomo,Ind. C16	11.65
Massillon,O. R8	11.65
Milwaukee C23	11.85
Monessen,Pa. P7, P16	11.65
Palmer,Mass. W12	11.95
Pawtucket,R.I. N8	11.95
Philadelphia P24	11.95
Riverdale,Ill. A1	11.75
Rome,N.Y. R6	11.65
Sharon,Pa. S3	11.65
Trenton,N.J. R5	11.95
Warren,O. B9	11.65
Worcester,Mass. A7, T6	11.95

NAILS, Stock

	Col.
AlabamaCity,Ala. R2	173
Aliquippa,Pa. J5	173
Atlanta A11	173
Bartonville,Ill. K4	175
Chicago W13	173
Cleveland A9	173
Crawfordsville,Ind. M8	175
Donora,Pa. A7	173
Duluth A7	173
Fairfield,Ala. T2	173
Houston S5	178
Jacksonville,Fla.(20) MS	184
Johnstown,Pa. B2	173
Joliet,Ill. A7	173
KansasCity,Mo. S5	178
Kokomo,Ind. C16	175
Minnequa,Colo. C10	178
Monessen,Pa. P7	173
Pittsburg,Calif. C11	192
Rankin,Pa. A7	173
S.Chicago,Ill. R2	173
SparrowsPt.,Md. B2	175
Sterling,Ill.(7) N15	175
Worcester,Mass. A7	179

(To Wholesalers; per cwt)

Galveston,Tex. D7	$9.10

NAILS, Cut (100 lb keg)

To Dealers (33)

Conshohocken,Pa. A3	$9.80
Wheeling,W.Va. W10	9.80

POLISHED STAPLES

	Col.
AlabamaCity,Ala. R2	175
Aliquippa,Pa. J5	175
Atlanta A11	177
Bartonville,Ill. K4	177
Crawfordsville,Ind. M8	177
Donora,Pa. A7	175
Duluth A7	175
Fairfield,Ala. T2	175
Houston S5	180
Jacksonville,Fla.(20) M8	186
Johnstown,Pa. B2	175
Joliet,Ill. A7	175
KansasCity,Mo. S5	180
Kokomo,Ind. C6	177
Minnequa,Colo. C10	180
Pittsburg,Calif. C11	194
Rankin,Pa. A7	175
S.Chicago,Ill. R2	175
SparrowsPt.,Md. B2	177
Sterling,Ill.(7) N15	175
Worcester,Mass. A7	181

TIE WIRE, Automatic Baler (14½ Ga.)(Per 97 lb Net Box)

Coil No. 3150

AlabamaCity,Ala. R2	$10.26
Atlanta A11	10.36
Bartonville,Ill. K4	10.36
Buffalo W12	10.26
Chicago W13	10.26
Crawfordsville,Ind. M8	10.36
Donora,Pa. A7	10.26
Duluth A7	10.26
Fairfield,Ala. T2	10.26
Houston S5	10.51
Jacksonville,Fla. M8	10.82
Johnstown,Pa. B2	10.26
Joliet,Ill. A7	10.26
KansasCity,Mo. S5	10.51
Kokomo,Ind. C16	10.36
LosAngeles B3	11.05
Minnequa,Colo. C10	10.51
Pittsburg,Calif. C11	11.04
S.Chicago,Ill. R2	10.26
S.SanFrancisco C10	11.04
SparrowsPt.,Md. B2	10.36
Sterling,Ill.(3?) N15	10.36

Coil No. 6500 Stand.

AlabamaCity,Ala. R2	$10.60
Atlanta A11	10.70
Bartonville,Ill. K4	10.70
Buffalo W12	10.60
Chicago W13	10.60
Crawfordsville,Ind. M8	10.70
Donora,Pa. A7	10.60
Duluth A7	10.60
Fairfield,Ala. T2	10.60
Houston S5	10.85
Jacksonville,Fla. M8	11.16
Johnstown,Pa. B2	10.60
Joliet,Ill. A7	10.60
KansasCity,Mo. S5	10.85
Kokomo,Ind. C16	10.70
LosAngeles B3	11.40
Minnequa,Colo. C10	10.85
Pittsburg,Calif. C11	11.40
S.Chicago,Ill. R2	10.60
S.SanFrancisco C10	11.40
SparrowsPt.,Md. B2	10.70
Sterling,Ill.(37) N15	10.70

Coil No. 6500 Interim

AlabamaCity,Ala. R2	$10.65
Atlanta A11	10.75
Bartonville,Ill. K4	10.75
Buffalo W12	10.65
Chicago W13	10.65
Crawfordsville,Ind. M8	10.75
Donora,Pa. A7	10.65
Duluth A7	10.65
Fairfield,Ala. T2	10.65
Houston S5	10.90
Jacksonville,Fla. M8	11.21
Johnstown,Pa. B2	10.65
Joliet,Ill. A7	10.65
KansasCity,Mo. S5	10.90
Kokomo,Ind. C16	10.75
LosAngeles B3	11.45
Minnequa,Colo. C10	10.90
Pittsburg,Calif. C11	11.45
S.Chicago,Ill. R2	10.65
S.SanFrancisco C10	11.45
SparrowsPt.,Md. B2	10.75
Sterling,Ill.(37) N15	10.75

BALE TIES, Single Loop

	Col.
AlabamaCity,Ala. R2	212
Atlanta A11	214
Bartonville,Ill. K4	214
Crawfordsville,Ind. M8	214
Donora,Pa. A7	212
Duluth A7	212
Fairfield,Ala. T2	212
Houston S5	217
Jacksonville,Fla. M8	219
Joliet,Ill. A7	212
KansasCity,Mo. S5	217
Kokomo,Ind. C16	214
Minnequa,Colo. C10	217
Pittsburg,Calif. C11	236
S.SanFrancisco C10	236
SparrowsPt.,Md. B2	214
Sterling,Ill.(7) N15	214

FENCE POSTS

Birmingham C15	172
ChicagoHts.,Ill. C2, I-2	172
Duluth A7	172
Franklin,Pa. F5	172
Huntington,W.Va. C15	172
Johnstown,Pa. B2	172
Marion,O. P11	172
Minnequa,Colo. C10	177
Sterling,Ill.(1) N15	172
Tonawanda,N.Y. B12	174

WIRE, Barbed

	Col.
AlabamaCity,Ala. R2	193••
Aliquippa,Pa. J5	190§
Atlanta A11	198•
Bartonville,Ill. K4	198
Crawfordsville,Ind. M8	198
Donora,Pa. A7	193†
Duluth A7	193†
Fairfield,Ala. T2	193†
Houston S5	198••
Jacksonville,Fla. M8	203
Johnstown,Pa. B2	196§
Joliet,Ill. A7	193†
KansasCity,Mo. S5	198••
Kokomo,Ind. C16	195†
Minnequa,Colo. C10	198••
Monessen,Pa. P7	196•
Pittsburg,Calif. C11	213†
Rankin,Pa. A7	193†
S.Chicago,Ill. R2	193••
S.SanFrancisco C10	213••
SparrowsPoint,Md. B2	198§
Sterling,Ill.(7) N15	198††

WOVEN FENCE, 9-15 Ga. Col.

Ala.City,Ala. R2	187••
Aliq'ppa,Pa.9-14½ga.J5	190§
Atlanta A11	192•
Bartonville,Ill. K4	192
Crawfordsville,Ind. M8	192
Donora,Pa. A7	187†
Duluth A7	187†
Fairfield,Ala. T2	187†
Houston S5	192••
Jacksonville,Fla. M8	197
Johnstown,Pa.(43) B2	190§
Joliet,Ill. A7	187†
KansasCity,Mo. S5	192••
Kokomo,Ind. C16	189†
Minnequa,Colo. C10	192••
Pittsburg,Calif. C11	210†
Rankin,Pa. A7	187†
S.Chicago,Ill. R2	187••
Sterling,Ill.(7) N15	192††

WIRE (16 gage)	An'ld Stone	Galv. Stone
Ala.City,Ala.R2	17.15	18.70••
Aliq'ppa,Pa. J5	.17.15	18.95
Bartonville K4	..17.25	19.05
Cleveland A7	...17.15	....
Crawf'dsville M8	17.25	19.05
Fostoria,O. S1	..17.65	19.20†
Houston S5	..17.40	18.95••
Jacksonville M8	17.50	19.30
Johnstown B2	..17.15	18.95§
Kan.City,Mo. S5	17.40	....
Kokomo C16	..17.25	18.80†
Minnequa C10	..17.40	18.95••
P'lm'r,Mass. W12	17.45	19.00†
Pitts.,Calif. C11	17.50	19.05†
SparrowsPt. B2	17.25	19.05§
Sterling(37)N15	17.25	19.05††
Waukegan A7	..17.15	18.70†
Worcester A7	..17.45	....

WIRE, Merchant Quality

(6 to 8 gage)	An'ld Galv.
Ala.City,Ala. R2	8.65 9.20••
Aliquippa J5	....8.65 9.325§
Atlanta(48) A11	..8.75 9.425•
Bartonville(48) K4	8.75 9.425
Buffalo W12	....8.65 9.20†
Cleveland A7	....8.65 ....
Crawfordsville M8	8.75 9.425
Donora,Pa. A7	..8.65 9.20†
Duluth A7	....8.65 9.20†
Fairfield T2	....8.65 9.20†
Houston(48) S5	..8.90 9.45••
Jacks'ville,Fla. M8	9.00 9.675
Johnstown B2(48)	8.65 9.325§
Joliet,Ill. A7	....8.65 9.20†
Kans.City(48) S5	8.90 9.45••
Kokomo C16	....8.75 9.30†
LosAngeles B3	..9.60 10.275§
Minnequa C10	..8.90 9.45••
Monessen P7(48)	..8.65 9.25•
Palmer,Mass. W12	8.95 9.50†
Pitts.,Calif. C11	..9.60 10.15†
Rankin,Pa. A7	..8.65 9.20†
S.Chicago R2	..8.65 9.20••
S.SanFran. C10	..9.60 10.15••
Spar'wsPt.B2(48)	8.75 9.425§
Sterling(48) N15	8.90 9.575††
Sterling(1) (48)	8.80 9.475††
Struthers,O. Y1	...8.65 9.30‡
Worcester,Mass.A7	8.95 9.50†

Based on zinc price of: •13.50. †5c. §10c. ‡Less than 10c. ††10.50c. ••Subject to zinc equalization extras.

FASTENERS

(Base discounts, full container quantity, per cent off list, f.o.b. mill)

BOLTS

Carriage, Machine Bolts

Full Size Body (cut thread)

½ in. and smaller:	
6 in. and shorter	49.0
Longer than 6 in.	39.0
⅝ in. thru 1 in.:	
6 in. and shorter	39.0
Longer than 6 in.	35.0
1⅛ in. and larger:	
All lengths	35.0

Undersized Body (rolled thread)

½ in. and smaller:	
6 in. and shorter	49.0

Carriage, Machine, Lag Bolts

Hot Galvanized:

½ in. and smaller:	
6 in. and shorter	29.0
Longer than 6 in.	15.0
⅝ in. and larger:	
All lengths	12.0

Lag Bolts (all diam.)

6 in. and shorter	49.0
Longer than 6 in.	39.0

Plow and Tap Bolts

½ in. and smaller by 6 in. and shorter	49.0
Larger than ½ in. or longer than 6 in.	39.0

Blank Bolts 39.0

Step, Elevator, Tire Bolts 49.0

Stove Bolts, Slotted:

⅛ to ¼ in. incl.:	
3 in. and shorter	55.0
5/16 to ½ in., inclusive	55.0

NUTS

Reg. & Heavy Square Nuts:

All sizes	55.5

Square Nuts, Reg. & Heavy, Hot Galvanized:

All sizes	41.0

Hex Nuts, Reg. & Heavy, Hot Pressed:

¾ in. and smaller	60.5
⅞ in. to 1 in., incl.	55.5
1⅛ in. to 1½ in., incl.	58.5
1⅝ in. and larger	53.5

Hex Nuts, Reg. & Heavy, Cold Punched:

¾ in. and smaller	60.5
⅞ in. to 1½ in., incl.	55.5
1⅝ in. and larger	53.5

Hex Nuts, All Types, Hot Galvanized:

¾ in. and smaller	46.5
⅞ in. to 1 in., incl.	41.5
1⅛ in. to 1½ in., incl.	46.5

Hex Nuts, Semifinished, Heavy (Incl. Slotted):

¾ in. and smaller	60.5
⅞ in. to 1½ in., incl.	55.5
1⅝ in. and larger	53.5

Hex Nuts, Finished (Incl. Slotted and Castellated):

1 in. and smaller	63.0
1⅛ in. to 1½ in., incl.	59.0
1⅝ in. and larger	53.5

Semifinished Hex Nuts, Reg. (Incl. Slotted):

⅝ in. and smaller	60.5
¾ in. to 1 in., incl.	63.0
1⅛ in. to 1½ in., incl.	59.0
1⅝ in. and larger	53.5

CAP AND SETSCREWS

(Base discounts, packages, per cent off list, f.o.b. mill)

Hex Head Capscrews, Coarse or Fine Thread, Bright:

6 in. and shorter:

⅝ in. and smaller	40.0
¾, ⅞, and 1 in. diam.	22.0
Longer than 6 in.:	
⅝ in. and smaller	8.0
¾, ⅞, and 1 in. diam.	+ 6.0

High Carbon, Heat Treated:

6 in. and shorter:

⅝ in. and smaller	26.0
¾, ⅞, and 1 in. diam.	3.0

Longer than 6 in.:

⅝ in. and smaller	+ 13.0
¾, ⅞, and 1 in. diam.	+ 32.0

Flat Head Capscrews:

¾ in. and smaller + 76.0

Setscrews, Square Head, Cup Point, Coarse Thread:

Through 1 in. diam.:

6 in. and shorter	Net
Longer than 6 in.	+ 23

RIVETS

F.o.b. Cleveland and/or freight equalized with Pittsburgh, f.o.b. Chicago and/or freight equalized with Birmingham except where equalization is too great.

Structural ½ in., larger 12.25

⅞ in. under: List less 19%

BOILER TUBES

Net base c.l. prices, dollars per 100 ft. mill; minimum wall thickness, cut lengths 10 to 24 ft, inclusive.

O.D. In.	B.W. Gage	Seamless H.R.	Seamless C.D.	Elec. Weld H.R.
1	13	....	25.98	23.54
1¼	13	....	30.78	23.36
1½	13	29.03	34.01	25.83
1¾	13	34.29	40.18	30.51
2	13	38.44	45.05	34.20
2¼	13	43.29	50.75	38.52
2½	12	46.99	55.06	41.81
2½	12	51.76	60.65	46.05
2¾	12	56.04	65.67	49.88
3	12	59.76	70.03	53.19

RAILWAY MATERIALS

Rails	Standard No. 1	Standard No. 2	Tee Rails All	Tee Rails 60 lb Under
Bessemer,Pa. U5	5.525	5.425	....	6.50
Ensley,Ala. T2	5.525	5.425	....	6.50
Fairfield,Ala. T2	....	....	....	6.50
Gary,Ind. U5	5.525	5.425	....	....
Huntington,W.Va. C15	....	....	....	6.50
IndianaHarbor,Ind. I-2	5.525	5.425	5.475	....
Johnstown,Pa. B2	....	....	....(16)	6.50
Lackawanna,N.Y. B2	5.525	5.425	....	6.50
Minnequa,Colo. C10	5.525	5.425	....	7.00
Steelton,Pa. B2	5.525	5.425	....	....
Williamsport,Pa. S19	....	....	....	6.50

TIE PLATES

Fairfield,Ala. T2	6.60
Gary,Ind. U5	6.60
Ind.Harbor,Ind. I-2	6.60
Lackawanna,N.Y. B2	6.60
Minnequa,Colo. C10	6.60
Seattle B3	6.75
Steelton,Pa. B2	6.60
Torrance,Calif. C11	6.75

JOINT BARS

Bessemer,Pa. U5	6.975
Fairfield,Ala. T2	6.975
Ind.Harbor,Ind. I-2	6.975
Joliet,Ill. U5	6.975
Lackawanna,N.Y. B2	6.975
Minnequa,Colo. C10	6.975
Steelton,Pa. B2	6.975

AXLES

Ind.Harbor,Ind. S13	8.775
Johnstown,Pa. B2	8.775

TRACK BOLTS, Untreated

Cleveland R2	14.75
KansasCity,Mo. S5	14.75
Lebanon,Pa. B2	14.75
Minnequa,Colo. C10	14.75
Pittsburgh P14	14.75
Seattle B3	15.25

SCREW SPIKES

Lebanon,Pa. B2	14.50

STANDARD TRACK SPIKES

Fairfield,Ala. T2	9.75
Ind.Harbor,Ind. I-2, Y1	9.75
KansasCity,Mo. S5	9.75
Lebanon,Pa. B2	9.75
Minnequa,Colo. C10	9.75
Pittsburgh J5	9.75
Seattle B3	10.25
S.Chicago,Ill. R2	9.75
Struthers,O. Y1	9.75
Youngstown R2	9.75

Footnotes

(1) Chicago base.
(2) Angles, flats, bands.
(3) Merchant.
(4) Reinforcing.
(5) 1¼ to under 1 7/16 in.; 1 7/16 to under 1 15/16 in., 6.70c; 1 15/16 to 8 in., inclusive, 7.05c.
(6) Chicago or Birm. base.
(7) Chicago base 2 cols. lower.
(8) 16 Ga. and heavier.
(9) Merchant quality; add 0.35c for special quality.
(10) Pittsburgh base.
(11) Cleveland & Pitts. base.
(12) Worcester, Mass. base.
(13) Add 0.25c for 17 Ga. & heavier.
(14) Gage 0.143 to 0.249 in.; for gage 0.142 and lighter, 5.80c.
(15) 3/8" and thinner.
(16) 40 lb and under.
(17) Flats only; 0.25 in. & heavier.
(18) To dealers.
(19) Chicago & Pitts. base.
(20) Plus 1c per 100 lb.
(21) New Haven, Conn. base.
(22) Deld. San Francisco Bay area.
(23) Special quality.
(24) Deduct 0.15c, finer than 15 Ga.
(25) Bar mill bands.
(27) Bar mill sizes.
(28) Bonderized.
(29) Youngstown base.
(30) Sheared; for universal mill add 0.45c.
(31) Widths over ⅝ in.; 7.40c, for widths ⅝ in. and under by 0.125 in. and thinner.
(32) Buffalo base.
(33) To jobbers, deduct 20c.
(34) 9.60c for cut lengths.
(35) 72" and narrower.
(36) 54" and narrower.
(37) Chicago base, 10 points lower.
(38) 14 Ga. & lighter; 48" & narrower.
(39) 48" and narrower.
(40) Lighter than 0.035"; 0.035" and heavier, 0.25c higher.
(41) 9.10c for cut lengths.
(42) Mill lengths, f.o.b. mill; deld. in mill zone or within switching limits, 5.685c.
(43) 9-14½ Ga.
(44) To fabricators.
(48) 6-7 Ga.
(49) 3½ in. and smaller rounds; 9.30c, over 3½ in. and other shapes.

SEAMLESS STANDARD PIPE, Threaded and Coupled

Carload discounts from list, %

Size—Inches	2		2½		3		3½		4		5		6	
List Per Ft	37c		58.5c		76.5c		92c		$1.09		$1.48		$1.92	
Pounds Per Ft	3.68		5.82		7.62		9.20		10.89		14.81		19.18	
	Blk	Galv*	Blk	Galv*	Blk	Galv*	Blk	Galv*	Blk	Galv*	Blk	Galv*	Blk	Galv*
Aliquippa, Pa. J5	+9.25	+24.25	+2.75	+19.5	+0.25	+17	1.25	+15.5	1.25	+15.5	1	+15.75	3.5	+13.25
Ambridge, Pa. N2	+9.25	....	+2.75	....	+0.25	....	1.25	....	1.25	....	1	....	3.5	....
Lorain, O. N3	+9.25	+24.25	+2.75	+19.5	+0.25	+17	1.25	+15.5	1.25	+15.5	1	+15.75	3.5	+13.25
Youngstown Y1	+9.25	+24.25	+2.75	+19.5	+0.25	+17	1.25	+15.5	1.25	+15.5	1	+15.75	3.5	+13.25

ELECTRIC STANDARD PIPE, Threaded and Coupled

Carload discounts from list, %

Youngstown R2	+9.25	+24.25	+2.75	+19.5	+0.25	+17	1.25	+15.5	1.25	+15.5	1	+15.75	3.5	+13.25

BUTTWELD STANDARD PIPE, Threaded and Coupled

Carload discounts from list, %

Size—Inches	⅛		¼		⅜		½		¾		1		1¼	
List Per Ft	5.5c		6c		6c		8.5c		11.5c		17c		23c	
Pounds Per Ft	0.24		0.42		0.57		0.85		1.13		1.68		2.28	
	Blk	Galv*	Blk	Galv*	Blk	Galv*	Blk	Galv*	Blk	Galv*	Blk	Galv*	Blk	Galv*
Aliquippa, Pa. J5	....	....	....	....	....	....	5.25	+10	8.25	+6	11.75	+1.5	14.25	+0.75
Alton, Ill. L1	....	....	....	....	....	....	3.25	+12	6.25	+8	9.75	+3.5	12.25	+2.75
Benwood, W. Va. W10	4.5	+22	+7.5	+31	+18	+39.5	5.25	+10	8.25	+6	11.75	+1.5	14.25	+0.75
Butler, Pa. F6	5.5	+21	+6.5	+30	+17	+38.5	....	....	....	....	....	....	....	....
Etna, Pa. N2	....	....	....	....	....	....	5.25	+10	8.25	+6	11.75	+1.5	14.25	+0.75
Fairless, Pa. N3	....	....	....	....	....	....	3.25	+12	6.25	+8	9.75	+3.5	12.25	+2.75
Fontana, Calif. K1	....	....	....	....	....	....	+8.25	+23.5	+5.25	+19.5	+1.75	+15	0.75	+14.25
Indiana Harbor, Ind. Y1	....	....	....	....	....	....	4.25	+11	7.25	+7	10.75	+2.5	13.25	+3.25
Lorain, O. N3	....	....	....	....	....	....	5.25	+10	8.25	+6	11.75	+1.5	14.25	+0.75
Sharon, Pa. S4	5.5	+21	+6.5	+30	+17	+38.5	....	....	....	....	....	....	....	....
Sharon, Pa. M6	....	....	....	....	....	....	5.25	+10	8.25	+6	11.75	+1.5	14.25	+0.75
Sparrows Pt., Md. B2	3.5	+23	+8.5	+32	+19	+40.5	3.25	+12	6.25	+8	9.75	+3.5	12.25	+2.75
Wheatland, Pa. W9	5.5	+21	+6	+30	+17	+38.5	5.25	+10	8.25	+6	11.75	+1.5	14.25	+0.75
Youngstown R2, Y1	....	....	....	....	....	....	5.25	+10	8.25	+6	11.75	+1.5	14.25	+0.75

Size—Inches	1½		2		2½		3		3½		4	
List Per Ft	27.5c		37c		58.5c		76.5c		92c		$1.09	
Pounds Per Ft	2.73		3.68		5.82		7.62		9.20		10.89	
	Blk	Galv*	Blk	Galv*	Blk	Galv*	Blk	Galv*	Blk	Galv*	Blk	Galv*
Aliquippa, Pa. J5	14.75	0.25	15.25	0.75	16.75	0.5	16.75	0.5	....	....	....	....
Alton, Ill. L1	12.75	+1.75	13.25	+1.25	14.75	+1.5	14.75	+1.5	....	....	....	....
Benwood, W. Va. W10	14.75	0.25	15.25	0.75	16.75	0.5	16.75	0.5	6.25	+10.5	6.25	+10.5
Etna, Pa. N2	14.75	0.25	15.25	0.75	16.75	0.5	16.75	0.5	6.25	+10.5	6.25	+10.5
Fairless, Pa. N3	12.75	+1.75	13.25	+1.25	14.75	+1.5	14.75	+1.5	4.25	+12.5	4.25	+12.5
Fontana, Calif. K1	1.25	+13.25	1.75	+12.75	3.25	+13	3.25	+13	+7.25	+24	+7.25	+24
Indiana Harbor, Ind. Y1	13.75	+0.75	14.25	+0.25	15.75	+0.5	15.25	+0.5	5.25	+11.5	5.25	+11.5
Lorain, O. N3	14.75	0.25	15.25	0.75	16.75	0.5	16.75	0.5	....	....	....	....
Sharon, Pa. M6	14.75	0.25	15.25	0.75	16.75	0.5	16.75	0.5	....	....	....	....
Sparrows Pt., Md. B2	12.75	+1.75	13.25	+1.25	14.75	+1.5	14.75	+1.5	4.25	+12.5	4.25	+12.5
Wheatland, Pa. W9	14.75	0.25	15.25	0.75	16.75	0.5	16.75	0.5	6.25	+10.5	6.25	+10.5
Youngstown R2, Y1	14.75	0.25	15.25	0.75	16.75	0.5	16.75	0.5	6.25	+10.5	6.25	+10.5

*Galvanized pipe discounts based on current price of zinc (10.00c, East St. Louis).

Stainless Steel

Representative prices, cents per pound; subject to current lists of extras

AISI Type	—Rerolling— Ingot	Slabs	Forging Billets	H.R. Strip	H.R. Rods; C.F. Wire	Bars; Structural Shapes	Plates	Sheets	C.R. Strip; Flat Wire
201	22.00	27.00	....	36.00	40.00	42.00	44.25	48.50	45.00
202	23.75	30.25	36.50	39.00	40.75	43.00	45.00	49.25	49.25
301	23.25	28.00	37.25	37.25	42.00	44.25	46.25	51.25	47.50
302	25.25	31.50	38.00	40.50	42.75	45.00	47.25	52.00	52.00
302B	25.50	32.75	40.75	45.75	45.00	47.25	49.50	57.00	57.00
303	....	32.00	41.00	46.00	45.50	48.00	50.00	56.75	56.75
304	27.00	33.25	40.50	44.25	45.25	47.75	50.75	55.00	55.00
304L	....	....	48.25	51.50	53.00	55.50	58.50	63.25	62.75
305	28.50	36.75	42.50	47.50	45.25	47.75	51.25	58.75	58.75
308	30.75	38.25	47.25	50.25	52.75	55.75	66.25	63.00	63.00
309	39.75	49.50	57.75	64.50	63.75	67.00	71.00	80.50	80.50
310	49.75	61.50	78.00	84.25	86.50	91.00	92.75	96.75	96.75
314	....	....	77.50	....	86.50	91.00	92.75	99.00	104.25
316	39.75	49.50	62.25	69.25	69.25	73.00	76.75	80.75	80.75
316L	....	55.50	70.00	76.50	77.00	80.75	84.50	89.25	88.50
317	48.00	60.00	76.75	88.25	86.25	90.75	93.50	101.00	101.00
321	32.25	40.00	47.00	53.50	52.50	55.50	59.75	65.50	65.50
330	....	....	106.75	....	95.25	106.75	106.50	108.00	149.25
18-8 CbTa	37.00	46.50	55.75	63.50	61.50	64.75	69.75	79.25	79.25
403	....	....	32.00	....	35.75	37.75	40.25	48.25	48.25
405	19.50	25.50	29.75	36.00	33.50	35.25	37.50	46.75	46.75
410	16.75	21.50	28.25	31.00	32.00	33.75	35.00	40.25	40.25
416	....	....	28.75	....	32.50	34.25	36.00	48.25	48.25
420	26.00	33.50	34.25	41.75	39.25	41.25	45.25	52.00	62.00
430	17.00	21.75	28.75	32.00	32.50	34.25	36.00	40.75	40.75
430F	....	....	29.50	....	33.00	34.75	36.75	51.75	42.00
431	....	28.75	37.75	....	42.00	44.25	46.00	56.00	56.00
446	....	....	39.25	59.00	44.25	46.50	47.75	70.00	70.00

Stainless Steel Producers Are: Allegheny Ludlum Steel Corp.; American Steel & Wire Div., U. S. Steel Corp.; Anchor Drawn Steel Co., division of Vanadium-Alloys Steel Co.; Armco Steel Corp.; Babcock & Wilcox Co.; Bethlehem Steel Co.; J. Bishop & Co.; A. M. Byers Co.; G. O. Carlson Inc.; Carpenter Steel Co.; Charter Wire Products; Crucible Steel Co. of America; Damascus Tube Co.; Dearborn Div., Sharon Steel Corp.; Wilbur B. Driver Co.; Driver-Harris Co.; Eastern Stainless Steel Corp.; Firth Sterling Inc.; Fort Wayne Metals Inc.; Green River Steel Corp., subsidiary of Jessop Steel Co.; Indiana Steel & Wire Co.; Ingersoll Steel Div., Borg-Warner Corp.; Ellwood Ivins Steel Tube Works Inc.; Jessop Steel Co.; Johnson Steel & Wire Co. Inc.; Stainless Steel Div., Jones & Laughlin Steel Corp.; Joslyn Stainless Steels, division of Joslyn Mfg. & Supply Co.; Latrobe Steel Co.; Lukens Steel Co.; Maryland Fine & Specialty Wire Co. Inc.; McLouth Steel Corp.; Metal Forming Corp.; Midvale-Heppenstall Co.; National Standard Co.; National Tube Div., U. S. Steel Corp.; Pacific Tube Co.; Page Steel & Wire Div., American Chain & Cable Co. Inc.; Pittsburgh Rolling Mills Inc.; Republic Steel Corp.; Riverside-Alloy Metal Div., H. K. Porter Company Inc.; Rodney Metals Inc.; Sawhill Tubular Products Inc.; Sharon Steel Corp.; Simonds Saw & Steel Co.; Specialty Wire Co. Inc.; Standard Tube Co.; Superior Steel Corp.; Superior Tube Co.; Swepco Tube Corp.; Techalloy Co. Inc.; Timken Roller Bearing Co.; Trent Tube Co., subsidiary of Crucible Steel Co. of America; Tube Methods Inc.; Ulbrich Stainless Steels Inc.; U. S. Steel Corp.; Universal-Cyclops Steel Corp.; Vanadium-Alloys Steel Co.; Wall Tube & Metal Products Co.; Wallingford Steel Co., subsidiary of Allegheny Ludlum Steel Corp.; Washington Steel Corp.

Clad Steel

	Plates 5%	Plates Carbon Base 10%	Plates Carbon Base 15%	Plates Carbon Base 20%	Sheets Carbon Base 20%
Stainless					
302	....	....	....	....	37.50
304	34.70	37.95	42.25	46.70	39.75
304L	36.90	40.55	45.10	49.85	....
316	40.35	44.50	49.50	54.50	58.25
316L	45.05	49.35	54.70	60.10	....
316 Cb	47.30	53.80	61.45	69.10	....
321	36.60	40.05	44.60	49.30	47.25
347	38.25	42.40	47.55	52.80	57.00
405	28.60	29.85	33.35	36.85	....
410	28.15	29.55	33.10	36.70	....
430	28.30	29.80	33.55	37.25	....
Inconel	48.90	59.55	70.15	80.85	....
Nickel	41.65	51.95	62.30	72.70	....
Nickel, Low Carbon	41.95	52.60	63.30	74.15	....
Monel	43.35	53.55	63.80	74.05	....
Copper*	....	....	....	....	46.00

	Strip, Carbon Base —Cold Rolled— 10%	Both Sides
Copper*	33.95	40.25

*Deoxidized. Production points: Stainless-clad sheets, New Castle, Ind. I-4; stainless-clad plates, Claymont, Del. C22, Coatesville, Pa. L7, New Castle, Ind. I-4, and Washington, Pa. J3; nickel, inconel, monel-clad plates, Coatesville L7; copper-clad strip, Carnegie, Pa. S18.

Tool Steel

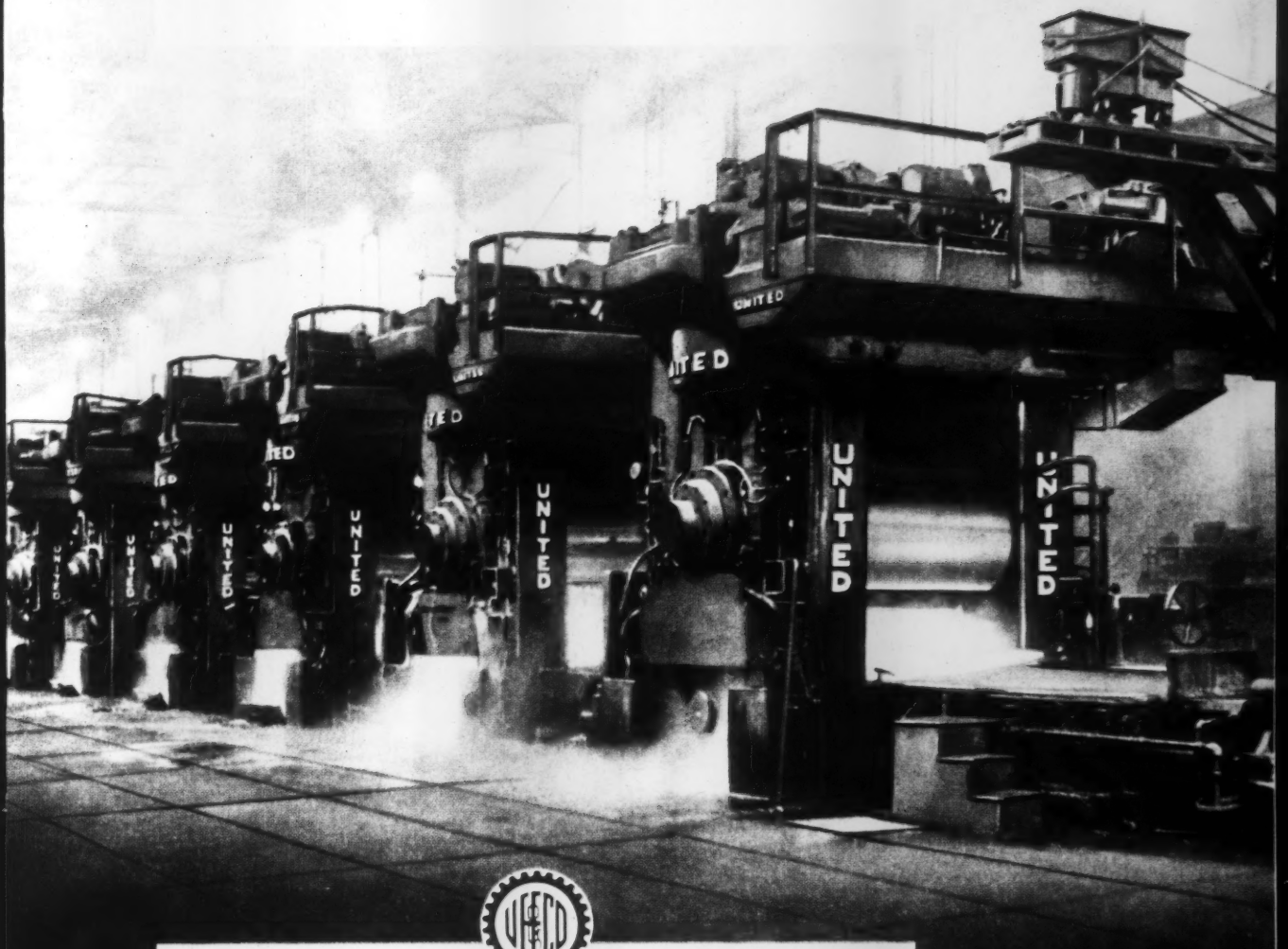
Grade	$ per lb	Grade	$ per lb
Regular Carbon	0.305	Cr-Hot Work	0.475
Extra Carbon	0.360	W-Cr Hot Work	0.500
Special Carbon	0.475	V-Cr Hot Work	0.520
Oil Hardening	0.475	Hi-Carbon-Cr	0.925

Grade by Analysis (%) W	Cr	V	Co	Mo		$ per lb
20.25	4.25	1.6	12.25	...	.....	4.285
18.25	4.25	1	4.75	...	.....	2.500
18	4	2	9	...	.....	2.870
18	4	2	....	...	.....	1.960
18	4	1	....	...	.....	1.795
9	3.5	..	....	...	.....	1.395
13.5	4	3	....	...	.....	2.060
13.75	3.75	2	5	...	.....	2.440
6.4	4.5	1.9	....	5	.....	1.300
6	4	3	....	6	.....	1.545
1.5	4	1	....	8.5	.....	1.155

Tool steel producers include: A4, A8, B2, B8, C4, C9, C13, C18, F2, J3, L3, M14, S8, U4, V2, and V3.

UNITED®

4-HIGH 6-STAND CONTINUOUS HOT STRIP MILL



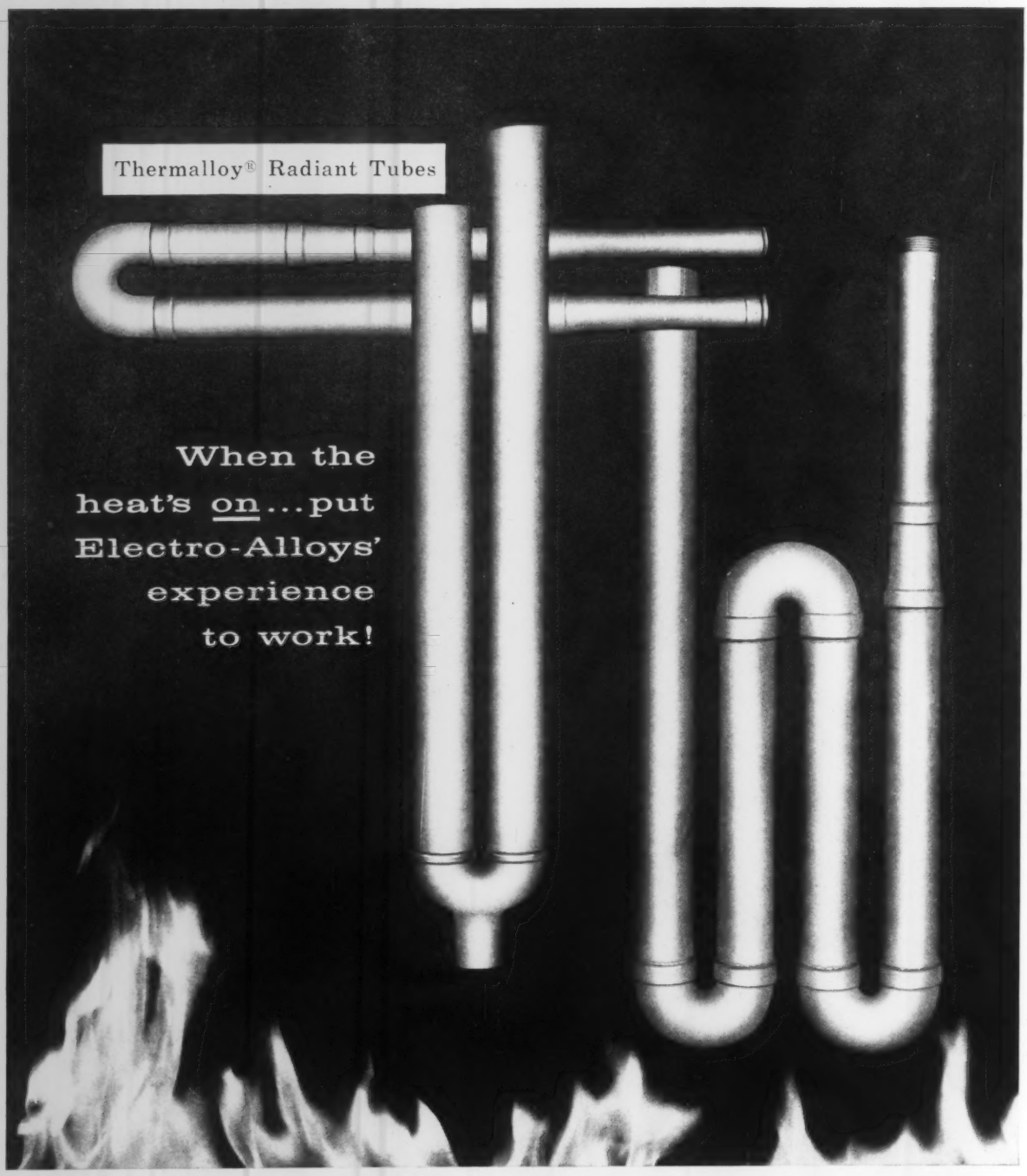
UEFCO®

UNITED ENGINEERING AND FOUNDRY COMPANY
PITTSBURGH, PENNSYLVANIA

Plants at Pittsburgh, Vandergrift, Youngstown, Canton, Wilmington

SUBSIDIARIES: Adamson United Company, Akron, Ohio; Stedman Foundry and Machine Co., Inc., Aurora, Indiana

Designers and Builders of Ferrous and Nonferrous Rolling Mills, Mill Rolls, Auxiliary Mill and Processing Equipment, Presses and other heavy machinery. Manufacturers of Iron, Nodular Iron and Steel Castings and Weldments.



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AMERICAN Brake Shoe COMPANY

ELECTRO-ALLOYS DIVISION • Elyria, Ohio

Pig Iron

F.o.b. furnace prices in dollars per gross ton, as reported to STEEL. Minimum delivered prices are approximate and do not include 3% federal transportation tax.

	Basic	No. 2 Foundry	Malle-able	Besse-mer
Birmingham District				
Birmingham R2	62.00	62.50‡	....	....
Birmingham U6	....	62.50‡	66.50	....
Woodward,Ala. W15	62.00**	62.50‡	66.50	....
Cincinnati, deld.	....	70.20	....	....
Buffalo District				
Buffalo H1, R2	66.00	66.50	67.00	67.50
N.Tonawanda,N.Y. T9	....	66.50	67.00	67.50
Tonawanda,N.Y. W12	66.00	66.50	67.00	67.50
Boston, deld.	77.29	77.79	78.29	....
Rochester,N.Y., deld.	69.02	69.52	70.02	....
Syracuse,N.Y., deld.	70.12	70.62	71.12	....
Chicago District				
Chicago I-3	66.00	66.50	66.50	67.00
S.Chicago,Ill. R2	66.00	66.50	66.50	67.00
S.Chicago,Ill. W14	66.00	....	66.50	67.00
Milwaukee, deld.	69.02	69.52	69.52	70.02
Muskegon,Mich., deld.	....	74.52	74.52	....
Cleveland District				
Cleveland R2, A7	66.00	66.50	66.50	67.00
Akron,Ohio, deld.	69.12	69.62	69.62	70.12
Mid-Atlantic District				
Birdsboro,Pa. B10	68.00	68.50	69.00	69.50
Chester,Pa. P4	68.00	68.50	69.00	....
Swedeland,Pa. A3	68.00	68.50	69.00	69.50
NewYork, deld.	....	75.50	76.00	....
Newark,N.J., deld.	72.69	73.19	73.69	74.19
Philadelphia, deld.	70.41	70.91	71.41	71.99
Troy,N.Y. R2	68.00	68.50	69.00	69.50
Pittsburgh District				
Nevilleisland,Pa. P6	66.00	66.50	66.50	67.00
Pittsburgh (N&S sides), Aliquippa, deld.	....	67.95	67.95	68.48
McKeesRocks,Pa., deld.	....	67.60	67.60	68.13
Lawrenceville,Homestead, Wilmerding,Monaca,Pa., deld.	....	68.26	68.26	68.79
Verona,Trafford,Pa., deld.	68.29	68.82	68.82	69.35
Brackenridge,Pa., deld.	68.60	69.10	69.10	69.63
Midland,Pa. C18	66.00	....	....	....
Youngstown District				
Hubbard,Ohio Y1	....	....	66.50	....
Sharpsville,Pa. S6	66.00	....	66.50	67.00
Youngstown Y1	....	....	66.50	67.00
Mansfield,Ohio, deld.	70.90	....	71.40	71.90
Duluth I-3	66.00	66.50	66.50	67.00
Erie,Pa. I-3	66.00	66.50	66.50	67.00
Everett,Mass. E1	67.50	68.00	68.50	....
Fontana,Calif. K1	75.00	75.50	....	....
Geneva,Utah C11	66.00	66.50	....	....
GraniteCity,Ill. G4	67.90	68.40	68.90	....
Ironton,Utah C11	66.00	66.50	....	....
Minnequa,Colo. C10	68.00	68.50	69.00	....
Rockwood,Tenn. T3	....	62.50‡	66.50	....
Toledo,Ohio I-3	66.00	66.50	66.50	67.00
Cincinnati, deld.	72.54	73.04	....	....

**Phos. 0.70-0.90%; Phos. 0.30-0.69%, $63.
‡Phos. 0.70-0.90%; Phos. 0.30-0.69%, $63.50.

PIG IRON DIFFERENTIALS

Silicon: Add 75 cents per ton for each 0.25% Si or percentage thereof over base grade, 1.75-2.25%, except on low phos. iron on which base is 1.75-2.00%.
Manganese: Add 50 cents per ton for each 0.25% manganese over 1% or portion thereof.
Nickel: Under 0.50% no extra; 0.50-0.74%, inclusive, add $2 per ton and each additional 0.25%, add $1 per ton.

BLAST FURNACE SILVERY PIG IRON, Gross Ton

(Base 6.00-6.50% silicon; add $1 for each 0.50% silicon or portion thereof over the base grade within a range of 6.50 to 11.50%; starting with silicon over 11.50% add $1.50 per ton for each 0.50% silicon or portion thereof up to 14%; add $1 for each 0.50% Mn over 1%)

Jackson,Ohio I-3, J1	$78.00
Buffalo H1	79.25

ELECTRIC FURNACE SILVERY IRON, Gross Ton

(Base 14.01-14.50% silicon; add $1 for each 0.5% Si to 18%; $1.25 for each 0.50% Mn over 1%; $2 per gross ton premium for 0.045% max P)

CalvertCity,Ky. P15	$99.00
NiagaraFalls,N.Y. P15	99.00
Keokuk,Iowa Open-hearth & Fdry, $9 freight allowed K2	103.50
Keokuk,Iowa O.H. & Fdry, 12½ lb piglets, 16% Si, max fr'gt allowed up to $9, K2	106.50

LOW PHOSPHORUS PIG IRON, Gross Ton

Lyles,Tenn. T3 (Phos. 0.035% max)	$78.50
Rockwood,Tenn. T3 (Phos. 0.035% max)	78.50
Troy,N.Y. R2 (Phos. 0.035% max)	74.00
Philadelphia, deld.	82.67
Cleveland A7 (Intermediate) (Phos. 0.036-0.075% max)	71.00
Duluth I-3 (Intermediate) (Phos. 0.036-0.075% max)	71.00
Erie,Pa. I-3 (Intermediate) (Phos. 0.036-0.075% max)	71.00
Nevilleisland,Pa. P6 (Intermediate) (Phos. 0.036-0.075% max)	71.00

Warehouse Steel Products

Representative prices, per pound, subject to extras, f.o.b. warehouse. City delivery charges are 15 cents per 100 lb except: Moline, Norfolk, Richmond, Washington, 20 cents; Baltimore, Boston, Los Angeles, New York, Philadelphia, Portland, Spokane, San Francisco, 10 cents; Atlanta, Chattanooga, Houston, Seattle, no charge.

	SHEETS				STRIP	BARS			Standard Structural Shapes	PLATES	
	Hot-Rolled	Cold-Rolled	Gal. 10 Ga.†	Stainless Type 302	Hot-Rolled*	H.R. Rounds	C.F. Rds.‡	H.R. Alloy 4140††§		Carbon	Floor
Atlanta	8.59§	9.86§	....	....	8.64	9.01	10.68	....	9.05	8.97	10.90
Baltimore	8.28	8.88	9.68	....	8.76	9.06	11.34 #	15.18	9.19	8.66	10.14
Birmingham	8.18	9.45	11.07	....	8.23	8.60	10.57	....	8.64	8.56	10.70
Boston	9.38	10.44	11.45	53.50	9.42	9.73	12.90 #	15.28	9.63	9.72	11.20
Buffalo	8.40	9.00	10.07	55.98	8.50	8.80	10.90 #	15.00	8.90	8.90	10.45
Chattanooga	8.35	9.69	9.65	....	8.40	8.77	10.46	....	8.88	8.80	10.66
Chicago	8.20	9.45	10.10	53.00	8.23	8.60	8.80	14.65	8.64	8.56	9.88
Cincinnati	8.34	9.48	10.05	52.43	8.54	8.92	9.31	14.96	9.18	8.93	10.21
Cleveland	8.18	9.45	9.95	52.33	8.33	8.69	10.80 #	14.74	9.01	8.79	10.11
Dallas	8.85	10.15	....	....	9.00	8.95	11.01	....	9.00	9.45	10.70
Denver	9.38	11.75	....	....	9.41	9.78	11.10	....	9.82	9.74	11.06
Detroit	8.43	9.70	10.45	56.50	8.58	8.90	9.15	14.91	9.18	8.91	10.13
Erie, Pa.	8.20	9.45	9.95[10]	....	8.50	8.75	9.05[10]	....	9.00	8.85	10.10
Houston	7.45	8.75	8.45	....	7.60	7.55	11.10	....	7.60	8.05	10.30
Jackson, Miss.	8.52	9.79	....	....	8.57	8.94	10.68	....	8.97	8.90	10.74
Los Angeles	8.50	10.75	11.65	57.60	8.55	8.55	12.00	....	8.60	8.55	9.95
Memphis, Tenn.	8.55	9.80	....	....	8.60	8.97	11.96 #	....	9.01	8.93	10.56
Milwaukee	8.33	9.58	10.23	....	8.36	8.73	9.03	14.78	8.85	8.69	10.01
Moline, Ill.	8.55	9.80	10.35	....	8.58	8.95	9.15	...	8.99	8.91	....
New York	8.87	10.13	10.56	53.08	9.31	9.57	12.76 #	15.09	9.35	9.43	10.71
Norfolk, Va.	8.05	....	....	....	8.55	8.60	10.80	....	8.95	8.45	9.95
Philadelphia	8.00	8.90	9.92	52.69	8.69	8.65	11.51 #	15.01	8.50	8.77	9.77**
Pittsburgh	8.18	9.45	10.45	52.00	8.33	8.60	10.80 #	14.65	8.64	8.56	9.88
Portland, Oreg.	8.50	11.20	11.55	57.38	9.55	8.65	14.50	15.95	8.65	8.30	11.50
Richmond, Va.	8.40	....	10.40	....	9.10	9.00	....	....	9.40	8.85	10.35
St. Louis	8.54	9.79	10.46	....	8.59	8.97	9.41	15.01	9.10	8.93	10.25
St. Paul	8.79	10.04	10.71	....	8.84	9.21	9.66	....	9.38	9.30	10.49
San Francisco	9.35	10.75	11.00	55.10	9.45	9.70	13.00	16.10	9.50	9.60	12.00
Seattle	9.95	11.15	12.00	57.38	10.00	10.10	14.05	16.35	9.80	9.70	12.10
South'ton, Conn.	9.07	10.33	10.71	....	9.48	9.74	...	....	9.57	9.57	10.91
Spokane	9.95	11.15	12.00	57.38	10.00	10.10	14.05	17.20	9.80	9.70	12.10
Washington	8.88	....	....	....	9.36	9.56	10.94	....	9.79	9.26	10.74

*Prices do not include gage extras; †prices include gage and coating extras; ‡includes 35-cent bar quality extras; §42 in. and under; **¼ in. and heavier; ††as annealed; ‡‡over 4 in.; §§over 3 in.; #1 in. round C-1018.
Base quantities, 2000 to 4999 lb except as noted; cold-rolled strip and cold-finished bars, 2000 lb and over except in Seattle, 2000 to 9999 lb, and in Los Angeles, 6000 lb and over; stainless sheets, 8000 lb except in Chicago, New York, Boston, Seattle, Portland, Oreg. 10,000 lb and in San Francisco, 2000 to 4999 lb; hot-rolled products on West Coast, 2000 to 9999 lb, except in Portland, Oreg., 1000 to 9999 lb; [3]—400 to 9999 lb; [8]—1000 to 1999 lb; [8]—2000 to 3999 lb; [10]—2000 lb and over.

Refractories

Fire Clay Brick (per 1000)

High-Heat Duty: Ashland, Grahn, Hayward, Hitchins, Haldeman, Olive Hill, Ky., Athens, Troup, Tex., Beech Creek, Clearfield, Curwensville, Lock Haven, Lumber, Orviston, West Decatur, Winburne, Snow Shoe, Pa., Bessemer, Ala., Farber, Mexico, St. Louis, Vandalia, Mo., Ironton, Oak Hill, Parral, Portsmouth, Ohio, Ottawa, Ill., Stevens Pottery, Ga., $135; Salina, Pa., $140; Niles, Ohio, $138; Cutler, Utah, $165.

Super-Duty: Ironton, Ohio, Vandalia, Mo., Olive Hill, Ky., Clearfield, Salina, Pa., New Savage, Md., St. Louis, $175; Stevens Pottery, Ga., $185; Cutler, Utah, $233.

Silica Brick (per 1000)

Standard: Alexandria, Claysburg, Mt. Union, Sproul, Pa., Ensley, Ala., Ft. Matilda, Pa., Portsmouth, Ohio, Hawstone, Pa., $150; Warren, Niles, Windham, Ohio, Hays, Latrobe, Morrisville, Pa., $155; E. Chicago, Ind., Joliet, Rockdale, Ill., $160; Lehigh, Utah, $175; Los Angeles, $180.

Super-Duty: Sproul, Hawstone, Pa., Niles, Warren, Windham, Ohio, Leslie, Md., Athens, Tex., $157; Morrisville, Hays, Latrobe, Pa., $160; E. Chicago, Ind., $167; Curtner, Calif., $182.

Semisilica Brick (per 1000)

Clearfield, Pa., $140; Philadelphia, $137; Woodbridge, N. J., $135.

Ladle Brick (per 1000)

Dry Pressed: Alsey, Ill., Chester, New Cumberland, W. Va., Freeport, Johnstown, Merrill Station, Vanport, Pa., Mexico, Vandalia, Mo., Wellsville, Irondale, New Salisbury, Ohio, $96.75; Clearfield, Pa. Portsmouth, Ohio, $102.

High-Alumina Brick (per 1000)

50 *Per Cent:* St. Louis, Mexico, Vandalia, Mo., $235; Danville, Ill., $238; Philadelphia, Clearfield, Pa., $230; Orviston, Snow Shoe, Pa., $245.

60 *Per Cent:* St. Louis, Mexico, Vandalia, Mo., $295; Danville, Ill., $298; Philadelphia, Clearfield, Orviston, Snow Shoe, Pa., $305.

70 *Per Cent:* St. Louis, Mexico, Vandalia, Mo., $335; Danville, Ill., $338; Philadelphia, Clearfield, Orviston, Snow Shoe, Pa., $345.

Sleeves (per 1000)

Reesdale, Johnstown, Bridgeburg, Pa., St. Louis, $188.

Nozzles (per 1000)

Reesdale, Johnstown, Bridgeburg, Pa., St. Louis, $310.

Runners (per 1000)

Reesdale, Johnstown, Bridgeburg, Pa., $234.

Dolomite (per net ton)

Domestic, dead-burned, bulk, Billmeyer, Blue Bell, Williams, Plymouth Meeting, York, Pa., Millville, W. Va., Bettsville, Millersville, Martin, Woodville, Gibsonburg, Narlo, Ohio, $16.75; Thornton, McCook, Ill., $17; Dolly Siding, Bonne Terre, Mo., $15.

Magnesite (per net ton)

Domestic, dead-burned, bulk ½ in. grains with fines: Chewelah, Wash., Luning, Nev., $46; ⅜ in. grains with fines: Baltimore, $73.

Fluorspar

Metallurgical grades, f.o.b. shipping point in Ill., Ky., net tons, carloads, effective CaF_2 content 72.5%, $37-41; 70%, $36.40; 60%, $33-36.50. Imported, net tons, f.o.b. cars point of entry, duty paid, metallurgical grade: European, $33-34; Mexican, all rail, duty paid, $25.25-25.75; barge, Brownsville, Tex., $27.25-27.75.

Ores

Lake Superior Iron Ore

(Prices effective for the 1958 shipping season, gross ton, 51.50% iron natural, rail of vessel, lower lake ports.)

Mesabi bessemer	$11.60
Mesabi nonbessemer	11.45
Old Range bessemer	11.85
Old Range nonbessemer	11.70
Open-hearth lump	12.70
High phos.	11.45

The foregoing prices are based on upper lake rail freight rates, lake vessel freight rates, handling and unloading charges, and taxes thereon, which were in effect Jan. 30, 1957, and increases or decreases after that date are absorbed by the seller.

Eastern Local Iron Ore

Cents per unit, deld. E. Pa.

New Jersey, foundry and basic 62-64% concentrates	25.00-27.00

Foreign Iron Ore

Cents per unit, c.i.f. Atlantic ports

Swedish basic, 65%	25.00
N. African hematite (spot)	nom.
Brazilian iron ore, 68-69%	27.00

Tungsten Ore

Net ton, unit

Foreign wolframite, good commercial quality	$12.00-12.50*
Domestic, concentrates f.o.b. milling points	20.00

*Before duty.

Manganese Ore

Mn 46-48%, Indian (export tax included), $135 per long ton unit, c.i.f. U. S. ports, duty for buyer's account: other than Indian, nominal; contracts by negotiation.

Chrome Ore

Gross ton, f.o.b. cars New York, Philadelphia, Baltimore, Charleston, S. C., plus ocean freight differential for delivery to Portland, Oreg., Tacoma, Wash.

Indian and Rhodesian

48% 3:1	$50.00
48% 2.8:1	48.00
48% no ratio	39.00

South African Transvaal

48% no ratio	$37.00
44% no ratio	27.00

Turkish

48% 3:1	$55.00

Domestic

Rail nearest seller

18% 3:1	39.00

Molybdenum

Sulfide concentrate, per lb of Mo content, mines, unpacked	$1.18

Antimony Ore

Per short ton unit of Sb content, c.i.f. seaboard

55-60%	$2.50-2.60
60-65%	2.60-2.90

Vanadium Ore

Cents per lb V_2O_5

Domestic	31.00

Metal Powder

(Per pound f.o.b. shipping point in ton lots for minus 100 mesh, except as noted)

	Cents
Sponge Iron, Swedish: Deld. east of Mississippi River, ocean bags 23,000 lb and over.. F.o.b. Riverton or Camden, N. J., west of Mississippi River.	10.50 / 9.50
Sponge Iron, Domestic, 98 + % Fe: Deld. east of Mississippi River, 23,000 lb and over	10.50
Electrolytic Iron: Melting stock, 99.9% Fe, irregular fragments of ⅛ in. x 1.3 in.	28.00
Annealed, 99.5% Fe..	36.50
Unannealed (99 + % Fe)	36.00
Unannealed (99 + % Fe) (minus 325 mesh)	59.00
Powder Flakes (minus 16, plus 100 mesh)..	29.00
Carbonyl Iron: 98.1-99.9%, 3 to 20 microns, depending on grade, 93.00-290.00 in standard 200-lb containers; all minus 200 mesh.	

Aluminum: Atomized, 500-lb drum, freight allowed: Carlots	39.50
Ton lots	41.50
Antimony, 500-lb lots	42.00*
Brass, 5000-lb lots	30.30-45.70†
Bronze, 5000-lb lots	45.70-49.80†
Copper: Electrolytic	14.75*
Reduced	14.75*
Lead	7.50*
Manganese: Minus 35 mesh	64.00
Minus 100 mesh	70.00
Minus 200 mesh	75.00
Nickel, unannealed	$1.15
Nickel-Silver, 5000-lb lots	47.80-52.60†
Phosphor-Copper, 5000-lb lots	57.80
Copper (atomized) 5000-lb lots	38.30-46.80‡
Silicon	47.50
Solder	7.00*
Stainless Steel, 304	$1.07
Stainless Steel, 316	$1.26
Tin	14.50*
Zinc, 5000-lb lots	17.50-30.70‡

Tungsten:	Dollars
Melting grade, 99%	
60 to 200 mesh:	
1000 lb and over..	3.15
Less than 1000 lb ..	3.30
Chromium, electrolytic 99.8% Cr min metallic basis	5.00

*Plus cost of metal. †Depending on composition. ‡Depending on mesh.

Electrodes

Threaded with nipple; unboxed, f.o.b. plant

GRAPHITE

Inches Diam	Inches Length	Per 100 lb
2	24	$60.75
2½	30	39.25
3	40	37.00
4	40	35.00
5⅛	40	34.75
6	60	31.50
7	60	28.25
8, 9, 10	60	28.00
12	72	26.75
14	60	26.75
16	72	25.75
17	60	26.25
18	72	26.25
20	72	25.25
24	84	26.00

CARBON

8	60	13.30
10	60	13.00
12	60	12.95
14	60	12.85
14	72	11.95
17	60	11.85
17	72	11.40
20	84	11.40
20	90	11.00
24	72, 84	11.25
24	96	10.95
30	84	11.05
40, 35	110	10.70
40	100	10.70

Metallurgical Coke

Price per net ton

Beehive Ovens

Connellsville, Pa., furnace	$14.75-15.75
Connellsville, Pa., foundry	18.00-18.50

Oven Foundry Coke

Birmingham, ovens	$28.85
Cincinnati, deld.	31.84
Buffalo, ovens	30.50
Camden, N. J., ovens	29.50
Detroit, ovens	30.50
Pontiac, Mich., deld.	32.25
Saginaw, Mich., deld.	33.83
Erie, Pa., ovens	30.50
Everett, Mass., ovens: New England, deld.	31.55*
Indianapolis, ovens	29.75
Ironton, Ohio, ovens	29.00
Cincinnati, deld.	31.84
Kearny, N. J., ovens	29.75
Milwaukee, ovens	30.50
Neville Island (Pittsburgh), Pa., ovens	29.25
Painesville, Ohio, ovens	30.50
Cleveland, deld.	32.69
Philadelphia, ovens	29.50
St. Louis, ovens	31.50
St. Paul, ovens	29.75
Chicago, deld.	33.29
Swedeland, Pa., ovens	29.50
Terre Haute, Ind., ovens	29.75

*Or within $4.85 freight zone from works.

Coal Chemicals

Spot, cents per gallon, ovens

Pure benzene	36.00
Toluene, one deg.	29.50
Industrial xylene	32.00-34.00

Per ton, bulk, ovens

Ammonium sulfate	$32.00-34.00

Cents per pound, producing point

Phenol: Grade 1, 17.50; Grade 2-3, 15.50; Grade 4, 17.50; Grade 5, 16.50; Grade 6, 14.50.

Imported Steel

(Base per 100 lb, landed, duty paid, based on current ocean rates. Any increase in these rates is for buyer's account. Source of shipment: Western continental European countries.)

	North Atlantic	South Atlantic	Gulf Coast	West Coast
Deformed Bars, Intermediate, ASTM-A 305	$5.88	$5.42	$5.42	$5.78
Bar Size Angles	5.77	5.65	5.65	5.95
Structural Angles	5.77	5.65	5.65	5.95
I-Beams	5.72	5.60	5.60	6.02
Channels	5.72	5.60	5.60	6.02
Plates (basic bessemer)	7.64	7.59	7.64	7.88
Sheets, H.R.	8.25	8.20	8.20	8.50
Sheets, C.R. (drawing quality)	9.00	8.95	8.95	9.25
Furring Channels, C.R., 1000 ft, ⅞ x 0.30 lb per ft	26.20	26.20	26.20	27.05
Barbed Wire (†)	6.95	6.95	6.95	7.40
Merchant Bars	6.37	6.32	6.37	6.61
Hot-Rolled Bands	7.20	7.15	7.15	7.55
Wire Rods, Thomas Commercial No. 5	6.73	6.73	6.73	7.13
Wire Rods, O.H. Cold Heading Quality No. 5	7.07	7.07	7.07	7.47
Bright Common Wire Nails ($)	8.12	8.12	8.12	8.32

†Per 82 lb, net, reel. $Per 100-lb kegs, 20d nails and heavier.

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MANGANESE ALLOYS

Spiegeleisen: Carlot, per gross ton, Palmerton, Neville Island, Pa., 21-23% Mn, $105; 19-21% Mn, 1-3% Si, $102.50; 16-19% Mn, $100.50.

Standard Ferromanganese: (Mn 74-76%, C 7% approx). Base price per net ton; $245, Johnstown, Duquesne, Sheridan, Neville Island, Pa.; Alloy, W. Va.; Ashtabula, Marietta, O.; Sheffield, Ala.; Portland, Oreg. Add or subtract $2 for each 1% or fraction thereof of contained manganese over 76% or under 74%, respectively. (Mn 79-81%), Lump $253 per net ton, f.o.b. Anaconda or Great Falls, Mont. Add $2.60 for each 1% above 81%; subtract $2.60 for each 1% below 79%, fractions in proportion to nearest 0.1%.

High-Grade Low-Carbon Ferromanganese: (Mn 85-90%). Carload, lump, bulk, max 0.07% C, 35.1c per lb of contained Mn, carload packed 36.4c, ton lots 37.9c, less ton 39.1c. Delivered. Deduct 1.5c for max 0.15% C grade from above prices, 3c for max 0.03% C, 3.5c for max 0.50% C, and 6.5c for max 75% C—max 7% Si. **Special Grade:** (Mn 90% min, C 0.07% max, P 0.06% max). Add 2.05c to the above prices. Spot, add 0.25c.

Medium-Carbon Ferromanganese: (Mn 80-85%, C 1.25-1.5%, Si 1.5% max). Carload, lump, bulk, 25.5c per lb of contained Mn, packed, carload 26.8c, ton lot 28.4c, less ton 29.6c. Delivered. Spot, add 0.25c.

Manganese Metal: 2" x D (Mn 95.5% min, Fe 2% max, Si 1% max, C 0.2%). Carload, lump, bulk, 45c per lb of metal; packed, 45.75c; ton lot 47.25c; less ton lot 49.25c. Delivered. Spot, add 2c.

Electrolytic Manganese Metal: Min carload, 34c; 2000 lb to min carload, 36c; 500 lb to 1999 lb, 38c; 50 lb cans, add 0.5c per lb. Premium for hydrogen-removed metal, 0.75c per lb. Prices are f.o.b. cars, Knoxville, Tenn., freight allowed to St. Louis or any point east of Mississippi; or f.o.b. Marietta, O., freight allowed.

Silicomanganese: (Mn 65-68%). Contract, lump, bulk 1.50% C grade, 18-20% Si, 12.8c per lb of alloy. Packed, c.l. 14c, ton 14.45c, less ton 15.45c, f.o.b. Alloy, W. Va.; Ashtabula, Marietta, O.; Sheffield, Ala.; Portland, Oreg. For 2% C grade, Si 15-17%, deduct 0.2% from above prices. For 3% C grade Si 12-14.5%, deduct 0.4c from above prices. Spot, add 0.25c.

TITANIUM ALLOYS

Ferrotitanium, Low-Carbon: (Ti 20-25%, Al 3.5% max, Si 4% max, C 0.10% max). Contract, ton lot, 2" x D, $1.50 per lb of contained Ti; less ton $1.55. (Ti 38.43%, Al 8% max, Si 4% max, C 0.10% max). Ton lot $1.35, less ton $1.37, f.o.b. Niagara Falls, N. Y., freight allowed to St. Louis. Spot, add 5c.

Ferrotitanium, High-Carbon: (Ti 15-18%, C 6-8%). Contract $200 per ton, f.o.b. Niagara Falls, N. Y., freight allowed to destinations east of Mississippi River and north of Baltimore and St. Louis.

Ferrotitanium, Medium-Carbon: (Ti 17-21%, C 2-4.5%). Contract $225 per ton, f.o.b. Niagara Falls, N. Y., freight not exceeding St. Louis rate allowed.

CHROMIUM ALLOYS

High-Carbon Ferrochrome: Contract, c.l. lump, bulk 28.75c per lb of contained Cr; c.l. packed 30.30c, ton lot 32.05c; less ton 33.45c. Delivered. Spot, add 0.25c.

Low-Carbon Ferrochrome: Cr 63-66% (Simplex), carload, lump, bulk, C 0.025% max, 36.75c per lb contained Cr; 0.010% max, 37.75c. Ton lot, add 3.5c; less ton, add 5.2c. Delivered.
Cr 67.71%, carload, lump, bulk, C 0.02% max, 41.00c per lb contained Cr; 0.025% max, 39.75c; 0.05% max, 39.00c; 0.10% max, 38.50c; 0.20% max, 38.25c; 0.50% max, 38.00c; 1.0% max, 37.75c; 1.5% max, 37.50c; 2.0% max, 37.25c. Ton lot, add 3.4c; less ton lot, add 5.1c. Delivered.

Foundry Ferrochrome, High-Carbon: (Cr 62-66%, C 5-7%, Si 7-10%). Contract, c.l., 2 in. x D, bulk 30.05c per lb of contained Cr. Packed, c.l. 31.65c, ton 33.45c, less ton 34.95c. Delivered. Spot, add 0.25c.

Foundry Ferrosilicon Chrome: (Cr 50-54%, Si 28-32%, C 1.25% max). Contract, carload, packed, 8M x D, 21.25c, per lb of alloy, ton lot 22.50c; less ton lot 23.70c. Delivered. Spot, add 0.25c.

Ferrochrome-Silicon: Cr 39-41%, Si 42-45%, C 0.05% max or Cr 33-36%, Si 45-48%, C 0.05% max. Carload, lump, bulk, 3" x down and 2" down, 27.50c per lb contained Cr, 14.20c per lb contained Si. 0.75" x down, 28.65c per lb contained Cr, 14.20c per lb contained Si. Delivered.

Chromium Metal Electrolytic: Commercial grade (Cr 99.8% min, metallic basis, Fe 0.2% max). Contract, carlot, packed ¼" x D plate (about ⅛" thick) $1.29 per lb, ton lot $1.31, less ton lot $1.33. Delivered. Spot, add 5c.

VANADIUM ALLOYS

Ferrovanadium: Open-hearth grade (V 50-55%, Si, 8% max, C 3% max). Contract, any quantity, $3.30 per lb of contained V. Delievered. Spot, add 10c. **Special Grade:** (V 50-55% or 70-75%, Si 2% max, C 0.5% max) $3.30. **High Speed Grade:** (V 50-55%, or 70-75%, Si 1.50% max, C 0.20% max) $3.40.

Grainal: Vanadium Grainal No. 1 $1.50 per lb; No. 6, 68c; No. 79, 50c, freight allowed.

Vanadium Oxide: Contract less carload lot, packed, $1.38 per lb contained V_2O_5, freight allowed. Spot, add 5c.

SILICON ALLOYS

25-30% Ferrosilicon: Contract, carload, lump, bulk, 20.0c per lb of contained Si. Packed 21.40c; ton lot 22.50c, f.o.b. Niagara Falls, N. Y., freight not exceeding St. Louis rate allowed.

50% Ferrosilicon: Contract, carload, lump, bulk, 14.20c per lb of contained Si. Packed c.l. 16.70c, ton lot 18.15c, less ton 19.80c, f.o.b. Alloy, W. Va.; Ashtabula, Marietta, O.; Sheffield, Ala.; Portland, Oreg. Spot, add 0.45c.

Low-Aluminum 50% Ferrosilicon: (Al 0.40% max). Add 1.45c to 50% ferrosilicon prices.

65% Ferrosilicon: Contract, carload, lump, bulk, 15.25c per lb contained silicon. Packed, c.l. 17.25c, ton lot 19.05c; less ton 20.4c. Delivered. Spot, add 0.35c.

75% Ferrosilicon: Contract, carload, lump, bulk, 16.4c per lb of contained Si. Packed, c.l. 18.30c, ton lot 19.95c, less ton 21.2c. Delivered. Spot, add 0.3c.

90% Ferrosilicon: Contract, carload, lump, bulk, 19.5c per lb of contained Si. Packed, c.l. 21.15c, ton lot 22.55c, less ton 23.6c. Delivered. Spot, add 0.25c.

Silicon Metal: (98% min Si, 0.75% max Fe, 0.07% max Ca). C.l. lump, bulk, 22.00c per lb of Si. Packed, c.l. 23.65c, ton lot 24.95c, less ton 25.95c. Add 0.5c for max 0.03% Ca grade. Deduct 0.5c for max 1% Fe grade analyzing min 99.75% Si; 0.75c for max 1.25% Fe grades analyzing min 96.75% Si. Spot, add 0.25c.

Alsifer: (Approx 20% Al, 40% Si, 40% Fe). Contract, basis f.o.b. Niagara Falls, N. Y., lump, carload, bulk, 10.65c per lb of alloy; ton lot, packed, 11.8c.

ZIRCONIUM ALLOYS

12-15% Zirconium Alloy: (Zr 12-15%, Si 39-43%, C 0.20% max). Contract, c.l. lump, bulk 9.25c per lb of alloy. Packed, c.l. 10.45c, ton lot 11.6c, less ton 12.45c. Delivered. Spot, add 0.25c.

35-40% Zirconium Alloy: (Zr 35-40%, Si 47-52%, Fe 8-12%, C 0.50% max). Contract, carload, lump, packed 27.25c per lb of alloy, ton lot 28.4c, less ton 29.65c. Freight allowed. Spot, add 0.25c.

BORON ALLOYS

Ferroboron: (B 17.50% min, Si 1.50% max, Al 0.50% max, C 0.50% max). Contract, 100 lb or more 1" x D, $1.20 per lb of alloy; less than 100 lb $1.30. Delivered. Spot, add 5c. F.o.b. Washington, Pa., prices, 100 lb and over are as follows: Grade A (10-14% B) 85c per lb; Grade B (14-18% B) $1.20; Grade C (19% min B) $1.50.

Borosil: (3 to 4% B, 40 to 45% Si). Carload, bulk, lump, or 3" x D, $5.25 per lb of contained B. Packed, carload $5.40, ton to c.l. $5.50, less ton $5.60. Delivered.

Bortam: (B 1.5-1.9%). Ton lot, 45c per lb; less than ton lot, 50c per lb.

Carbortam: (B 1 to 2%). Contract, lump, carload 9.50c per lb f.o.b. Suspension Bridge, N. Y., freight allowed same as high-carbon ferrotitanium.

CALCIUM ALLOYS

Calcium-Manganese-Silicon: (Ca 16-20%, Mn 14-18% and Si 53-59%). Contract, carload, lump, bulk 23c per lb of alloy, carload packed 24.25c, ton lot 26.15c, less ton 27.15c. Delivered. Spot, add 0.25c.

Calcium-Silicon: (Ca 30-33%, Si 60-65%, Fe 1.5-3%). Contract, carload, lump, bulk 24c per lb of alloy, carload packed 25.65c, ton lot 27.95c, less ton 29.45c. Delivered. Spot, add 0.25c.

BRIQUETTED ALLOYS

Chromium Briquets: (Weighing approx 3⅛ lb each and containing 2 lb of Cr). Contract, carload, bulk 19.60c per lb of briquet, carload packed in box pallets 19.80c, in bags 20.70c; 3000 lb to c.l. in box pallets 21.00c; 2000 lb to c.l. in bags, 21.90c; less than 2000 lb in bags 22.80c. Delivered. Add 0.25c for notching. Spot, add 0.25c.

Ferromanganese Briquets: (Weighing approx 3 lb and containing 2 lb of Mn). Contract, carload, bulk 14.8c per lb of briquet; c.l., packed, pallets 15c, bags 16c; 3000 lb to c.l., pallets 16.2c; 2000 lb to c.l., bags, 17.2c; less ton 18.1c. Delivered. Add 0.25c for notching. Spot, add 0.25c.

Silicomanganese Briquets: (Weighing approx 3½ lb and containing 2 lb of Mn and approx ½ lb of Si). Contract, c.l. bulk 15.1c per lb of briquet; c.l. packed, pallets, 15.3c; bags 16.3c, 3000 lb to c.l., pallets, 16.5c; 2000 lb to c.l., bags 17.5c; less ton 18.4c. Delivered. Add 0.25c for notching. Spot, add 0.25c.

Silicon Briquets: (Large size—weighing approx 5 lb and containing 2 lb of Si). Contract, carload, bulk 7.7c per lb of briquet; packed, pallets, 7.9c; bags 8.9c; 3000 lb to c.l., pallets 9.5c; 2000 lb to c.l., bags 10.5c; less ton 11.4c. Delivered. Spot, add 0.25c; (Small size—weighing approx 2½ lb and containing 1 lb of Si.) Carload, bulk 7.85c. Packed, pallets 8.05c; bags 9.05c; 3000 lb to c.l., pallets 9.65c; 2000 lb to c.l., bags, 10.65c; less ton 11.55c. Delivered. Add 0.25c for notching, small size only. Spot, add 0.25c.

Molybdic-Oxide Briquets: (Containing 2½ lb of Mo each). $1.41 per pound of Mo contained, f.o.b. Langeloth, Pa.

TUNGSTEN ALLOYS

Ferrotungsten: (70-80%), 5000 lb W or more $2.95 per lb of contained W; 2000 lb W to 5000 lb W, $3.05; less than 2000 lb W, $3.17. Delivered.

OTHER FERROALLOYS

Ferrocolumbium: (Cb 50-60%, Si 8% max, C 0.4% max). Contract, ton lot 2" x D, $4.90 per lb of contained Cb. Delivered. Spot, add 10c.

Ferrotantalum—Columbium: (Cb 40% approx, Ta 20% approx, and Cb plus Ta 60% min, C 0.30% max). Ton lot 2" x D, $4.25 per lb of contained Cb plus Ta, delivered; less ton lot $4.30.

SMZ Alloy: (Si 60-65%, Mn 5-7%, Zr 5.7%, Fe 20% approx). Contract, c.l. packed ½-in. x 12 M 20.00c per lb of alloy, ton lot 21.15c, less ton 22.40c. Delivered. Spot, add 0.25c.

Graphidox No. 5: (Si 48-52%, Ca 5-7%, Ti 9-11%). C.l. packed, 19c per lb of alloy, ton lot 20.15c; less ton lot 21.4c, f.o.b. Niagara Falls, N. Y.; freight allowed to St. Louis.

V-5 Foundry Alloy: (Cr 38-42%, Si 17-19%, Mn 8-11%). C.l. packed 18.1c per lb of alloy; ton lot 19.55c; less ton lot 20.8c, f.o.b. Niagara Falls, N. Y.; freight allowed to St. Louis.

Simanal: (Approx 20% each Si, Mn, Al; bal Fe). Lump, carload, bulk 18.50c. Packed c.l. 19.50c, 2000 lb to c.l. 20.50c, less than 2000 lb 21c per lb of alloy. Delivered.

Ferrophosphorus: (23-25% based on 24% P content with unitage of $4 for each 1% of P above or below the base); carload, f.o.b. sellers' works. Mt. Pleasant, Siglo, Tenn., $110 per gross ton.

Ferromolybdenum: (55-75%). Per lb of contained Mo, in 200-lb. container, f.o.b. Langeloth and Washington, Pa., $1.68 in all sizes except powdered which is $1.74.

Technical Molybdic-Oxide: Per lb of contained Mo, in cans, $1.39; in bags, $1.38, f.o.b. Langeloth and Washington, Pa.

(*Concluded from Page 172*)

land. With more shops there estimating on pending work, contractors are shopping for lower prices, being less concerned with deliveries. As a result, there is more delay in closing on tonnage. School needs, taking a high ratio of light structurals and bar joists, are giving rise to intensive competition among fabricators.

STRUCTURAL SHAPES . . .

STRUCTURAL STEEL PLACED

2700 tons, addition, state hospital, Ward's Island, New York, through Depot Construction Co., general contractor, to Schacht Steel Construction Inc., New York.

1500 tons, Union Pacific Railroad warehouse, Portland, Oreg., to Isaacson Iron Works, Seattle.

316 tons, Washington State, Naches River Bridge, Yakima County, to Bethlehem Pacific Coast Steel Corp., Seattle; Walter G. Meyers & Sons, Spokane, Wash., general contractor.

300 tons, addition, Wilmington Trust Co., Wilmington, Del., to Cantley & Co., Philadelphia, through Turner Construction Co.

300 tons, estimated, Atomic Research Laboratory addition, Bethlehem Steel Co., Quincy Shipyard, to Bethlehem Steel Co., Bethlehem, Pa.

225 tons, also 75 tons of reinforcing, Washington State, King County bridge, to Poole, McGonigle & Dick, Portland, Oreg.; Lockyear & White, Longview, Wash., general contractor.

120 tons, building, United States Gypsum Co., Boston, to A. O. Wilson Structural Co., Cambridge, Mass.; John J. Griffin Co., Cambridge, general contractor.

117 tons, Washington State, highway bridge, Clark County, to Bethlehem Pacific Coast Steel Corp., Seattle.

85 tons, dormitory, College of Puget Sound, Tacoma, Wash., to Standard Iron & Wire Co., Tacoma; Strom Construction Co., Tacoma, general contractor at $317,934.

STRUCTURAL STEEL PENDING

4900 tons, 1566.8-ft viaduct, composite plate girders, Cross Bronx Expressway, Bronx N. Y.; Terry Contracting Co. Inc., New York, general contractor.

1440 tons, five highway separations, composite I-beams, interstate Route 502, Saratoga County, New York; Arute Bros. Inc., New Britain, Conn., general contractor.

900 tons, state bridge work, LR 67058, Philadelphia County, Pennsylvania; bids Mar. 27.

370 tons, state bridge work, LR 64123, Beaver County, Pennsylvania; bids Mar. 28.

350 tons, one I-beam and box girder bridge, Bangor, Maine; bids March. 12, Augusta, Maine.

345 tons, two I-beam bridges, Cumberland-Yarmouth, Maine; bids March 12, Augusta, Maine.

115 tons, including bars, state highway bridge, Westbrook, Conn.

REINFORCING BARS . . .

REINFORCING BARS PENDING

2455 tons, state bridge work, LR 67057/10/, Philadelphia County, Pennsylvania; bids Mar 27.

1193 tons, state bridge work, Philadelphia County, Pennsylvania; bids Mar. 27; 900 tons of structurals also required.

685 tons, highway structures, Bangor, Maine; bids Mar. 12, Augusta, Maine.

420 tons, dam and structures, Black River, North Springfield, Vt.; bids April 19, U. S. Engineer, Boston; also, 125 tons of structural steel, 50 tons of miscellaneous metal and 38 tons of anchor bars and rock bolts.

105 tons, state bridge work, Delaware County, Pennsylvania; bids Mar. 27.

350 tons, dam and structures, Naugatuck-Housatonic River Basin, Thomaston, Conn.; bids April 5, U. S. Engineer, Boston; also, 125 tons of structural steel.

197 tons, state bridge work, LR 764/8/, Allegheny County, Pennsylvania; bids Mar. 27.

190 tons, state bridge work, LR 641/23/, Beaver County, Pennsylvania; bids Mar. 28; 370 tons of structurals also required.

180 tons, two state bridges, Cumberland-Yarmouth, Maine; bids Mar. 12, Augusta, Maine.

PLATES . . .

PLATES PLACED

700 tons, containment vessel for experimental breeder reactor No. 2, Idaho Falls, Idaho, for the National Reactor Testing Station, Atomic Energy Commission, to Graver Tank & Mfg. Co., East Chicago, Ind.

145 tons, alloy, Class 2, Navy Purchasing Office, Washington, D. C., to Lukens Steel Co., Coatesville, Pa.

PLATES PENDING

1000 tons, hull plates, black, General Stores Supply, Navy, Philadelphia.

200 tons or more, storage and fueling system, Malmstrom Air Base, Great Falls, Mont.; Paul W. Larson, Salt Lake City, Utah, low at $1,110,321 to the U. S. Engineer, Walla Walla, Wash.

165 tons, fuel storage tanks, Fairchild AFB, Washington; bids about Mar. 25 to the U. S. Engineer, Washington.

125 tons, 10,000-bbl fuel tank, Andrews AFB, Maryland; bids to the U. S. Engineer, Washington, D. C., about Mar. 25.

PIPE . . .

CAST IRON PIPE PLACED

221 tons, 6 and 8-in. for Bellingham, Wash., to Pacific States Cast Iron Pipe Co., Seattle.

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STEELMAKING SCRAP PRICE COMPOSITE
Based on No. 1 heavy melting grade at Pittsburgh, Chicago, and eastern Pennsylvania—Compiled by STEEL.
1957
1958
JAN FEB MAR APR MAY JUNE JULY AUG SEPT OCT NOV DEC
Mar. 5 1958 $37.17
Week Ago $37.17
Month Ago $37.33
Year Ago $51.67
Feb. Avg. $37.33

Scrap Unchanged for Third Week

STEEL's composite on the prime steelmaking grade holds at $37.17 despite the absence of active demand and sluggish steel operations. Quality material is becoming scarce

Scrap Prices, Page 188

Pittsburgh — Industrial bundles from a stamping plant in this area are bringing prices $2 above those recently prevailing. The rise is attributed to a growing scarcity of quality material. Sellers are reluctant to sell at present price levels, but the mills are also reluctant to buy. Turnings and borings are in noticeably weak demand.

A mill on the fringe of the Pittsburgh area bought a small tonnage of No. 1 heavy melting and No. 2 heavy melting last week. This buy, along with the stronger price on industrial bundles, served to put the market on the melting grades up $1 a ton.

Philadelphia — While the major steel grades are unchanged, prices on the leading cast iron scrap items are up. No. 1 cupola is $2 higher at $40, delivered, on buying by the pipe foundries. Heavy breakable cast is up $1 to $41 and drop-broken machinery is up $1 to $50.

Short shoveling turnings and machine shop turnings are moving slowly. They are nominally easier at $23 and $21.

New York—Trends in the local scrap market are mixed. Brokers continue to ease their buying prices on the steel grades, but they are paying more for some grades of cast scrap, and for 18-8 sheets, clips and solids. For this latter material they are offering $150-$155 a ton.

With domestic consumption soft and export demand less pressing, brokers are now paying $33-$35 for No. 1 heavy melting and No. 1 bundles, and $29-$30 for No. 2 heavy melting, a reduction in each case. No. 2 bundles are unchanged, but brokers are paying $1 more for No. 1 cupola with the market $35-$36.

Chicago—Sparse buying and a district steelmaking rate that is a point lower than has been prevailing during the preceding two weeks have combined to drop prices of a few open hearth grades of scrap $1 a ton. Local steelmakers see nothing in the order picture that will support a higher steel ingot rate the remainder of this month, or even in April.

Youngstown—The scrap market is listless; little interest is being shown by consumers or sellers at present prices.

Detroit—Auto lists closed higher last week as dealers tried to push the market up in the face of little mill support. Less than 10,000 tons of bundles were on the lists, but some of this tonnage sold at rates as high as $37-38.

Cleveland—There's little in the way of buying in this market. Brokers bid up prices $3 to $4 a ton on the latest auto lists. No. 1 factory bundles rose to $37-$38.

Except for a little electric furnace and foundry buying, the market is devoid of consumer activity. Cut foundry steel is up $1 at $37-$38; cut structurals and plates, 2 ft and under, are quoted $3 higher at $44-$45; low phos punchings are $1 higher at $35-$36; so are electric furnace bundles at $35-$36.

Quality grades of scrap are becoming increasingly scarce.

Buffalo — The cast iron grades continue to edge upward, while the steel mill grades remain in the doldrums. Cupola cast is being quoted $1 higher at $41, while No. 1 machinery is also up $1 at $46.

Cincinnati—Scrap prices are up $1 to $4 a ton here on the placing of orders by a district mill. The increases are largely on the prime steelmaking grades, but several other

(*Please turn to Page 193*)

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Iron and Steel Scrap

Consumer prices per gross ton, except as otherwise noted, including brokers' commission, as reported to STEEL, Mar. 5, 1958. *Changes shown in italics.*

STEELMAKING SCRAP COMPOSITE

Mar. 5	$37.17
Feb. 26	37.17
Feb. Avg.	37.33
Mar. 1957	49.63
Mar. 1953	44.05

Based on No. 1 heavy melting grade at Pittsburgh, Chicago, and eastern Pennsylvania.

PITTSBURGH

No. 1 heavy melting	*36.00-37.00*
No. 2 heavy melting	*33.00-34.00*
No. 1 dealer bundles	*36.00-37.00*
No. 2 bundles	*30.00-31.00*
No. 1 busheling	*36.00-37.00*
No. 1 factory bundles	*40.00-41.00*
Machine shop turnings	17.00-18.00
Mixed borings, turnings	17.00-18.00
Short shovel turnings	21.00-22.00
Cast iron borings	21.00-22.00
Cut structurals:	
2 ft and under	*42.00-43.00*
3 ft lengths	*41.00-42.00*
Heavy turnings	*35.00-36.00*
Punchings & plate scrap	*41.00-42.00*
Electric furnace bundles	*41.00-42.00*

Cast Iron Grades

No. 1 cupola	40.00-41.00
Stove plate	40.00-41.00
Unstripped motor blocks	26.00-27.00
Clean auto cast	42.00-43.00
Drop broken machinery	49.00-50.00

Railroad Scrap

No. 1 R.R. heavy melt.	40.00-41.00
Rails, 2 ft and under	56.00-57.00
Rails, 18 in. and under	57.00-58.00
Angles, splice bars	49.00-50.00
Rails, rerolling	57.00-58.00

Stainless Steel Scrap

18-8 bundles & solids	*165.00-175.00*
18-8 turnings	85.00-90.00
430 bundles & solids	100.00-110.00
430 turnings	50.00-55.00

CLEVELAND

No. 1 heavy melting	33.00-34.00
No. 2 heavy melting	21.00-22.00
No. 1 factory bundles	*37.00-38.00*
No. 1 bundles	33.00-34.00
No. 2 bundles	23.00-24.00
No. 1 busheling	33.00-34.00
Machine shop turnings	11.00-12.00
Short shovel turnings	15.00-16.00
Mixed borings, turnings	15.00-16.00
Cast iron borings	15.00-16.00
Cut foundry steel	*37.00-38.00*
Cut structurals, plates 2 ft and under	*44.00-45.00*
Low phos. punchings & plate	*35.00-36.00*
Alloy free, short shovel turnings	19.00-20.00
Electric furnace bundles	*35.00-36.00*

Cast Iron Grades

No. 1 cupola	44.00-45.00
Charging box cast	36.00-37.00
Heavy breakable cast	36.00-37.00
Stove plate	43.00-44.00
Unstripped motor blocks	26.00-27.00
Brake shoes	34.00-35.00
Clean auto cast	45.00-46.00
Burnt cast	33.00-34.00
Drop broken machinery	48.00-49.00

Railroad Scrap

R.R. malleable	60.00-61.00
Rails, 2 ft and under	57.00-58.00
Rails, 18 in. and under	58.00-59.00
Rails, random lengths	50.00-51.00
Cast steel	47.00-48.00
Railroad specialties	51.00-52.00
Uncut tires	41.00-42.00
Angles, splice bars	51.00-52.00
Rails, rerolling	56.00-57.00

Stainless Steel

(Brokers' buying prices; f.o.b. shipping point)

18-8 bundles, solids	160.00-165.00
18-8 turnings	90.00-95.00
430 clips, bundles, solids	75.00-80.00
430 turnings	40.00-50.00

YOUNGSTOWN

No. 1 heavy melting	37.00-38.00
No. 2 heavy melting	25.00-26.00
No. 1 busheling	37.00-38.00
No. 1 bundles	37.00-38.00
No. 2 bundles	24.00-25.00
Machine shop turnings	13.00-14.00
Short shovel turnings	17.00-18.00
Cast iron borings	17.00-18.00
Low phos.	*39.00-40.00*
Electric furnace bundles	*39.00-40.00*

Railroad Scrap

No. 1 R.R. heavy melt.	42.00-43.00

CHICAGO

No. 1 heavy melt., indus.	*37.00-38.00*
No. 1 hvy melt., dealer	*35.00-36.00*
No. 2 heavy melting	34.00-35.00
No. 1 factory bundles	*40.00-41.00*
No. 1 dealer bundles	37.00-38.00
No. 2 bundles	28.00-29.00
No. 1 busheling, indus.	*37.00-38.00*
No. 1 busheling, dealer	*35.00-36.00*
Machine shop turnings	22.00-23.00
Mixed borings, turnings	24.00-25.00
Short shovel turnings	24.00-25.00
Cast iron borings	24.00-25.00
Cut structurals, 3 ft	44.00-45.00
Punchings & plate scrap	45.00-46.00

Cast Iron Grades

No. 1 cupola	41.00-42.00
Stove plate	38.00-39.00
Unstripped motor blocks	32.00-33.00
Clean auto cast	46.00-47.00
Drop broken machinery	46.00-47.00

Railroad Scrap

No. 1 R.R. heavy melt.	39.00-40.00
R.R. malleable	53.00-54.00
Rails, 2 ft and under	54.00-55.00
Rails, 18 in. and under	55.00-56.00
Angles, splice bars	51.00-52.00
Axles	54.00-55.00
Rails, rerolling	54.00-55.00

Stainless Steel Scrap

18-8 bundles & solids	160.00-165.00
18-8 turnings	85.00-95.00
430 bundles & solids	90.00-100.00
430 turnings	47.50-52.50

DETROIT

(Brokers' buying prices; f.o.b. shipping point)

No. 1 heavy melting	*31.00-32.00*
No. 2 heavy melting	23.00-24.00
No. 1 bundles	*32.00-33.00*
No. 2 bundles	20.00-21.00
No. 1 busheling	*30.00-31.00*
Machine shop turnings	*10.00-11.00*
Mixed borings, turnings	*11.00-12.00*
Short shovel turnings	*12.00-13.00*
Punchings & plate	*32.00-33.00*

Cast Iron Grades

No. 1 cupola	*37.00-38.00*
Stove plate	*31.00-32.00*
Charging box cast	*29.00-30.00*
Heavy breakable	*31.00-32.00*
Unstripped motor blocks	*21.00-22.00*
Clean auto cast	*39.00-40.00*

ST. LOUIS

(Brokers' buying prices)

No. 1 heavy melting	33.00
No. 2 heavy melting	30.00
No. 1 bundles	33.00
No. 2 bundles	25.00
No. 1 busheling	33.00
Machine shop turnings	18.00
Short shovel turnings	20.00

Cast Iron Grades

No. 1 cupola	45.00
Charging box cast	33.00
Heavy breakable cast	33.00
Unstripped motor blocks	33.00
Clean auto cast	45.00
Stove plate	41.00

Railroad Scrap

No. 1 R.R. heavy melt.	38.00
Rails, 18 in. and under	56.00
Rails, random lengths	50.00
Rails, rerolling	58.00
Angles, splice bars	49.00

PHILADELPHIA

No. 1 heavy melting	38.50
No. 2 heavy melting	35.00
No. 1 bundles	38.50
No. 2 bundles	28.00
No. 1 busheling	38.50
Electric furnace bundles	40.00
Mixed borings, turnings	22.50†
Short shovel turnings	*23.00†*
Machine shop turnings	*21.00†*
Heavy turnings	34.00†
Structurals & plate	43.00-44.00
Couplers, springs, wheels	46.00
Rail crops, 2 ft & under	58.00-60.00

Cast Iron Grades

No. 1 cupola	*40.00*
Heavy breakable cast	*41.00*
Malleable	58.00
Drop broken machinery	*50.00*

†Nominal

NEW YORK

(Brokers' buying prices)

No. 1 heavy melting	*33.00-35.00*
No. 2 heavy melting	*29.00-30.00*
No. 1 bundles	*33.00-35.00*
No. 2 bundles	23.00-24.00
Machine shop turnings	11.00-12.00
Mixed borings, turnings	12.00-13.00
Short shovel turnings	14.00-15.00
Low phos. (structurals & plate)	Nominal

Cast Iron Grades

No. 1 cupola	*35.00-36.00*
Unstripped motor blocks	32.00
Heavy breakable	32.00-33.00

Stainless Steel

18-8 sheets, clips, solids	*150.00-155.00*
18-8 borings, turnings	50.00
410 sheets, clips, solids	60.00-65.00
430 sheets, clips, solids	75.00-80.00

BOSTON

(Brokers' buying prices; f.o.b. shipping point)

No. 1 heavy melting	30.00
No. 2 heavy melting	22.00
No. 1 bundles	29.00
No. 2 bundles	17.00
No. 1 busheling	29.00
Machine shop turnings	9.50-10.00†
Mixed borings, turnings	9.50-10.00
Short shovel turnings	11.00-11.50†
No. 1 cast	29.00-30.00
Mixed cupola cast	28.00-29.00
No. 1 machinery cast	35.00-36.00

†Nominal

BUFFALO

No. 1 heavy melting	28.00-29.00
No. 2 heavy melting	25.00-26.00
No. 1 bundles	28.00-29.00
No. 2 bundles	23.00-24.00
No. 1 busheling	28.00-29.00
Mixed borings, turnings	14.00-15.00
Machine shop turnings	12.00-13.00
Short shovel turnings	15.00-16.00
Cast iron borings	14.00-15.00
Low phos.	32.00-33.00

Cast Iron Grades (F.o.b. shipping point)

No. 1 cupola	*40.00-41.00*
No. 1 machinery	*45.00-46.00*

Railroad Scrap

Rails, random lengths	47.00-48.00
Rails, 3 ft and under	53.00-54.00
Railroad specialties	37.00-38.00

CINCINNATI

(Brokers' buying prices; f.o.b. shipping point)

No. 1 heavy melting	*32.00-33.00*
No. 2 heavy melting	*28.50-29.50*
No. 1 bundles	*32.00-33.00*
No. 2 bundles	*25.00-26.00*
No. 1 busheling	*32.00-33.00*
Machine shop turnings	*15.00-16.00*
Mixed borings, turnings	15.00-16.00
Short shovel turnings	*19.00-20.00*
Cast iron borings	15.00-16.00
Low phos. 18 in.	*40.00-41.00*

Cast Iron Grades

No. 1 cupola	*40.00-41.00*
Heavy breakable cast	33.00-34.00
Charging box cast	33.00-34.00
Drop broken machinery	47.00-48.00

Railroad Scrap

No. 1 R.R. heavy melt.	34.00-35.00
Rails, 18 in. and under	54.00-55.00
Rails, random lengths	44.00-45.00

BIRMINGHAM

No. 1 heavy melting	32.00-33.00
No. 2 heavy melting	27.00-28.00
No. 1 bundles	31.00-32.00
No. 2 bundles	21.00-22.00
No. 1 busheling	31.00-32.00
Cast iron borings	12.00-13.00
Machine shop turnings	24.00-25.00
Short shovel turnings	25.00-26.00
Bar crops and plates	*40.00-41.00*
Structurals & plate	38.00-39.00
Electric furnace bundles	36.00-37.00
Electric furnace:	
2 ft and under	35.00-36.00
3 ft and under	34.00-35.00

Cast Iron Grades

No. 1 cupola	50.00-51.00
Stove plate	49.00-50.00
Unstripped motor blocks	40.00-41.00
Charging box cast	22.00-23.00
No. 1 wheels	38.00-39.00

Railroad Scrap

No. 1 R.R. heavy melt.	36.00-37.00
Rails, 18 in. and under	49.00-50.00
Rails, rerolling	*51.00-52.00*
Rails, random lengths	*44.00-45.00*
Angles, splice bars	42.00-43.00

SEATTLE

No. 1 heavy melting	28.00
No. 2 heavy melting	26.00
No. 1 bundles	22.00
No. 2 bundles	21.00
Machine shop turnings	18.00
Mixed borings, turnings	18.00
Electric furnace No. 1	38.00

Cast Iron Grades

No. 1 cupola	31.00
Heavy breakable cast	28.00
Unstripped motor blocks	23.00
Stove plate (f.o.b. plant)	21.00

LOS ANGELES

No. 1 heavy melting	32.00
No. 2 heavy melting	30.00
No. 1 bundles	28.00
No. 2 bundles	20.00
Machine shop turnings	9.00
Shoveling turnings	11.00
Cast iron borings	10.00
Cut structurals and plate 1 ft and under	43.00

Cast Iron Grades (F.o.b. shipping point)

No. 1 cupola	38.00

Railroad Scrap

No. 1 R.R. heavy melt.	32.00

SAN FRANCISCO

No. 1 heavy melting	32.00
No. 2 heavy melting	30.00
No. 1 bundles	30.00
No. 2 bundles	22.00
Machine shop turnings	15.00
Mixed borings, turnings	15.00
Cast iron borings	15.00
Heavy turnings	15.00
Short shovel turnings	15.00
Cut structurals, 3 ft	40.00

Cast Iron Grades

No. 1 cupola	40.00
Charging box cast	34.00
Stove plate	34.00
Heavy breakable cast	28.00
Unstripped motor blocks	31.00
Clean auto cast	40.00
Drop broken machinery	40.00
No. 1 wheels	34.00

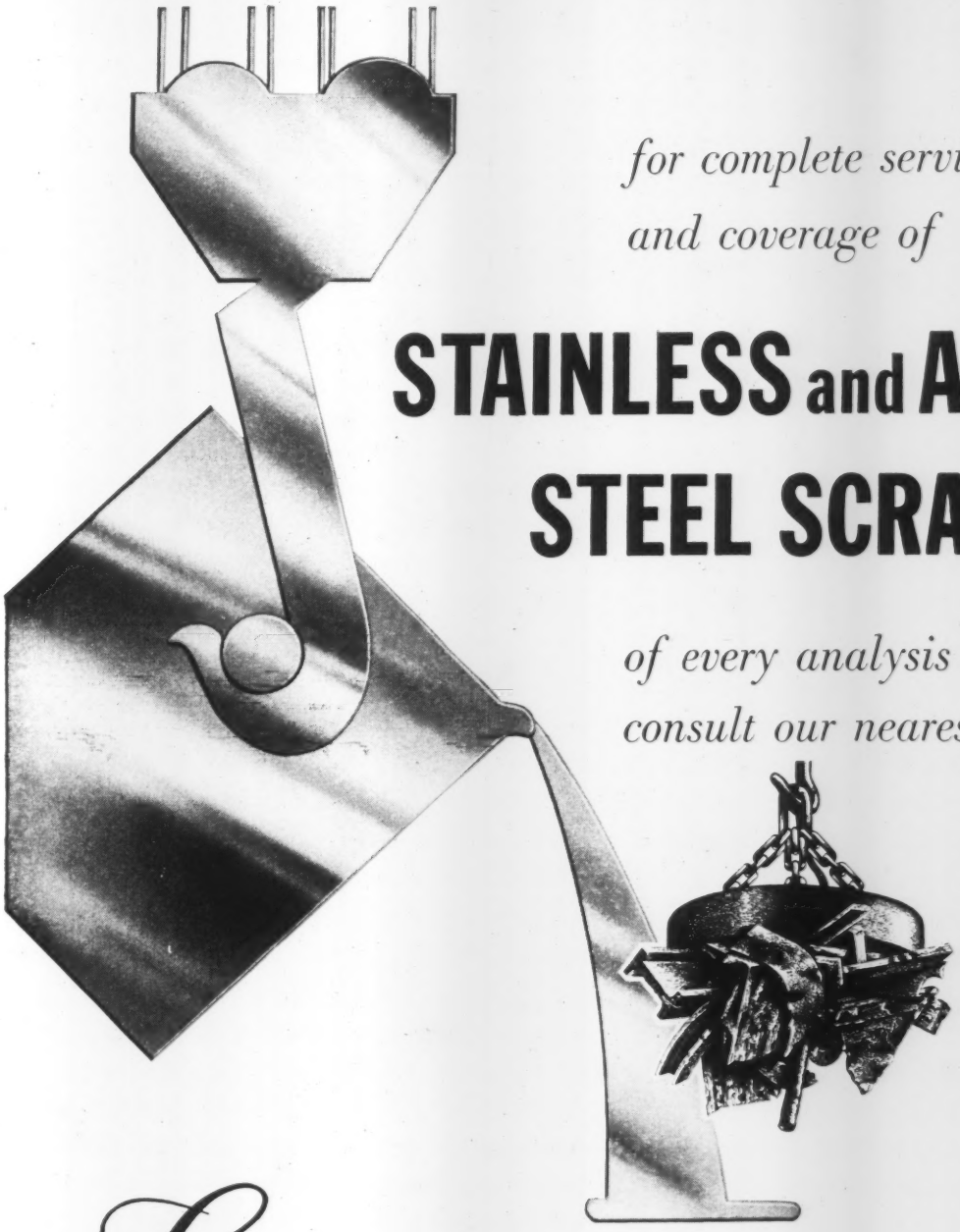
HAMILTON, ONT.

No. 1 heavy melting	32.00
No. 2 heavy melting	*28.00*
No. 1 bundles	32.00
No. 2 bundles	*25.00*
Mixed steel scrap	27.00
Mixed borings, turnings	17.00
Busheling, new factory: Prepared	32.00
Unprepared	26.00
Short steel turnings	21.00

Cast Iron Gradest

No. 1 machinery cast	45.00-50.00

†F.o.b. Hamilton, Ont.



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Copper Price in Danger

Primary producers may be forced to trim their quotation to meet competition from custom smelters and imports. Users should begin to feel production cutbacks shortly

Nonferrous Metal Prices, Pages 192 & 193

THE BIG QUESTION in copper circles is whether primary producers will cut their 25 cents a pound price. Consensus: A slash at any moment is likely.

Why—Custom smelters are quoting 23 cents a pound. Traditionally, when the primary-custom smelter spread reaches 2 cents, the primary price is lowered. Another factor: Dealers in the New York area (who buy overseas for sale in the U. S.) are offering electrolytic copper for 22.5 to 22.75 cents.

Putting an additional strain on the primary quotations are the low prices prevailing for foreign metal. The large Belgian producer, Union Miniere du Haut Katanga, has reduced its price to 20.425 cents a pound, c.i.f. New York. The London Metal Exchange price is hovering just above 20 cents a pound. Add 2 cents a pound for freight, insurance, and other costs, and domestic fabricators can buy LME copper for a little more than 22 cents, delivered New York.

Alternative—Observers say one of two things must happen: Either custom smelters will have to raise prices or primary producers will have to lower theirs. Custom smelters say they don't foresee a spurt in demand strong enough to boost their quotation.

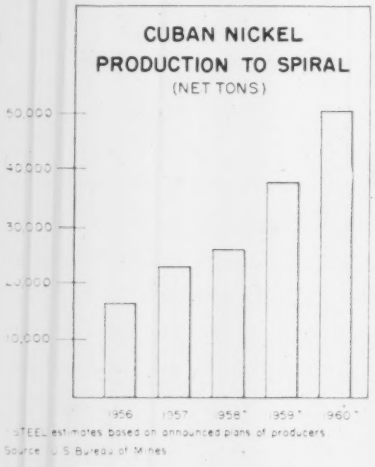
If the primary price is lowered, the betting is for a 1-cent drop to 24 cents a pound. Should this happen, a 2 cent a pound import-excise tax will be imposed. Provision has been made for it to become effective after the first calendar month in which the weighted average price stays under 24 cents. Observers believe this would cause London to lower quotations again.

Demand—Overseas sales remain high. Domestic demand still plods along, although March shows a little improvement over February. One gloomy note: A report that brass mills could fill all orders on their books and have 50,000 tons of copper left over.

Output — Most observers think the price structure will remain flimsy until production is brought more nearly into balance with consumption. While there are no exact figures on production curtailments, it's felt that Free World mine output has been trimmed by around 300,000 tons annually. But this figure doesn't take into account production from new mines and increased output from old ones.

The Big Three U. S. producers have cut domestic mine output by around 140,000 tons annually. Breakdown: Phelps Dodge, 60,000 tons; Kennecott, 50,000; Anaconda, 30,000.

It takes about three months from mine to market before cutbacks are noticed. Metalmen expect users will begin to feel the curtailments in March, even more in April.



*STEEL estimates based on announced plans of producers
Source: U.S. Bureau of Mines

Magnesium Output Down

Dow Chemical Co. has shut down it 45,000-ton-a-year magnesium works (Plant B) at Velasco, Tex. The facility was purchased from the government last November.

The company is still at close to 100 per cent operations in "Plant A," which has an annual rated capacity of 36,000 tons.

A Dow spokesman said mounting inventories of unsold metal forced the closedown. "Operations are now more at the level of sales," he said.

Business continues dull for magnesium fabricators. One indication: Aluminum Co. of America has closed down its Buffalo magnesium sand casting works.

More Cuban Nickel

By 1960, Cuba will be the world's second largest nickel producing country and will provide the largest source of cobalt in the Western Hemisphere. Forbes Wilson, vice president of Freeport Sulphur Co., says his firm's Cuban properties will turn out 25,000 tons of nickel and 2200 tons of cobalt annually, beginning in the summer of 1959. With Nicaro expanding to 25,000 tons this year, Cuban nickel production will be boosted to 50,000 tons by 1960 (see chart).

NONFERROUS PRICE RECORD

	Mar. 5 Price	Last Change	Previous Price	Feb. Avg	Jan. Avg	Mar., 1957 Avg
Aluminum	26.00	Aug. 1, 1957	25.00	26.000	26.000	25.000
Copper	23.00-25.00	Feb. 26, 1958	23.125-25.00	24.298	25.135	31.462
Lead	12.80	Dec. 2, 1957	13.30	12.800	12.800	15.800
Magnesium	35.25	Aug. 13, 1956	33.75	35.250	35.250	35.250
Nickel	74.00	Dec. 6, 1956	64.50	74.000	74.000	74.000
Tin	95.25	Mar. 5, 1958	94.75	93.818	92.933	99.683
Zinc	10.00	July 1, 1957	10.50	10.000	10.000	13.500

Quotations in cents per pound based on: COPPER, mean of primary and secondary, deld. Conn. Valley; LEAD, common grade, deld. St. Louis; ZINC, prime western, E. St. Louis; TIN, Straits, deld. New York; NICKEL, electrolytic cathodes, 99.9%, base size at refinery, unpacked; ALUMINUM, primary pig, 99.5+%, f.o.b. shipping point; MAGNESIUM, pig, 99.8%, Velasco, Tex.

BRIDGEPORT BRASS
COPPER ALLOY BULLETIN

Bridgeport Reporting New Developments in Copper-Brass Alloys and Metalworking Methods

by M. A. BUELL
Chief Staff Metallurgist

Practical Annealing Hints When Fabricating Copper and Brass Parts

In fabricating brass and copper parts, proper annealing practice can often mean the difference between profit and loss and acceptable and defective products.

There are, of course, a number of rules to follow, but the two most important are (1) to use the correct temperature and (2) to maintain uniform temperature.

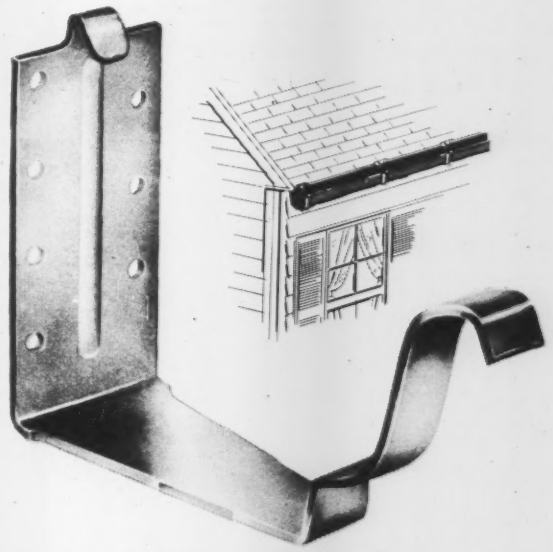
In determining the correct temperature, many variables come into play—weight and distribution of load, size and shape of the article and/or sequence of anneals, type and condition of the furnace, the alloy used, the amount of previous cold working, and the severity of the operations to follow. Generally speaking, experimentation with sample lots is advisable in determining the correct temperature and length of anneal.

For best results, annealing should be done at the lowest possible temperatures. Excessive temperatures produce extra-large grain sizes and "orange peel" effect after subsequent cold-drawing operations, and are also liable to aggravate surface oxidation. The net result is an increase in finishing problems and cost. It should always be remembered that work can be returned to the furnace for further annealing without harm, but damage caused by too high a temperature can never be corrected.

Work should always be thoroughly cleaned before being placed in the furnace. Failure to do this may lead to stains and scale which tend to load the tools and scratch the work and dies. After annealing, pickling with dilute sulphuric acid is essential.

Your Bridgeport Salesman, backed by Bridgeport's Technical Service, can help you. If you have any annealing problems don't hesitate to call him for advice.

How to Hang Low Production Costs and High Quality on the Right Alloy



Hanger for copper gutters is made of silicon-bronze for lower production costs, high strength and corrosion resistance.

Use of the right copper base alloy can often result in substantial savings in material costs without any sacrifice in quality or performance. An example is in the new "K" type box gutter hanger manufactured by Berger Bros. Co., Philadelphia, Pa.

Production Requirements

In addition to a high degree of corrosion resistance, this hanger had to have sufficient "springiness" and strength to support heavy snow loads on the gutter. As a result, specifications called for a metal which would withstand a 40-lb. pull test without deformation. Still another requirement was that the metal had to be sufficiently workable to be stamped and formed at high speed.

Choosing the Right Alloy

Originally, Berger Bros. considered using a phosphor bronze for the job, a material which would have been satisfactory. But, on examining all requirements, Bridgeport was able to suggest a way to save costs by recommending Duronze 632, a less expensive silicon bronze strip. Silicon bronze is as strong and as tough as mild steel yet has superior corrosion resistance.

To meet Berger's rigid production and performance standards, Bridgeport supplies the Duronze strip with a maximum B75 Rockwell hardness. This is achieved by a controlled last rolling and annealing prior to shipment. To date, the Bridgeport silicon bronze has performed with flying colors in all respects.

Teamwork that Saves Costs

This is one example of how Bridgeport's close customer service works for you to insure top product quality and performance at most economical cost. Our aim is to match the metal exactly to your job. It's Bridgeport's wide range of alloys and experienced technical service that makes this a benefit of real value to you. To put this service to work for you, call your nearest Bridgeport Sales Office.

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Nonferrous Metals

Cents per pound, carlots except as otherwise noted.

PRIMARY METALS AND ALLOYS

Aluminum: 99.5%, pigs, 26.00; ingots, 28.10, 10,000 lb or more, f.o.b. shipping point. Freight allowed on 500 lb or more.

Aluminum Alloy: No. 13, 29.90; No. 43, 29.70; No. 195, 31.30; No. 241, 31.50; No. 356, 29.90, 30-lb ingots.

Antimony: R.M.M. brand, 99.5%, 29.00; Lone Star brand, 29.50, f.o.b. Laredo, Tex., in bulk. Foreign brands, 99.5%, 23.50-24.50, New York, duty paid, 10,000 lb or more.

Beryllium: 97% lump or beads, $71.50 per lb, f.o.b. Cleveland or Reading, Pa.

Beryllium Aluminum: 5% Be, $74.75 per lb of contained Be, with balance as Al at market price, f.o.b. shipping point.

Beryllium Copper: 3.75-4.25% Be, $43 per lb of contained Be, with balance as Cu at market price on shipment date, f.o.b. shipping point.

Bismuth: $2.25 per ton, ton lots.

Cadmium: Sticks and bars, $1.55 per lb deld.

Cobalt: 97-99%, $2.00 per lb for 550-lb keg; $2.02 per lb for 100 lb case; $2.07 per lb under 100 lb.

Columbium: Powder, $55-90 per lb, nom.

Copper: Electrolytic, 25.00 deld.; custom smelters, 23.00; lake, 25.00 deld.; fire refined, 24.75 deld.

Germanium: First reduction, $179.17-197.31 per lb; intrinsic grade, $197.31-220 per lb, depending on quantity.

Gold: U. S. Treasury, $35 per oz.

Indium: 99.9%, $2.25 per troy oz.

Iridium: $70-90 nom. per troy oz.

Lead: Common, 12.80; chemical, 12.90; corroding, 12.90, St. Louis, New York basis, add 0.20.

Lithium: 98 + %, 50-100 lb, cups or ingots, $12; rod, $15; shot or wire, $16. 100-500 lb, cups or ingots, $10.50; rod, $14; shot or wire, $15, f.o.b. Minneapolis.

Magnesium: Pig, 35.25; ingot, 36.00 f.o.b. Velasco, Tex.; 12 in. thick, 59.00 f.o.b. Madison, Ill.

Magnesium Alloys: AZ91A (diecasting), 40.75 deld.; AZ63A, AZ92A, AZ91C (sand casting), 40.75, f.o.b. Velasco, Tex.

Mercury: Open market, spot, New York, $230-235 per 76-lb flask.

Molybdenum: Unalloyed, turned extrusions, 3.75-5.75 in. round, $9.60 per lb in lots of 2500 lb or more, f.o.b. Detroit.

Nickel: Electrolytic cathodes, sheets (4 x 4 in. and larger), unpacked, 74.00; 10-lb pigs, unpacked, 78.25; "XX" nickel shot, 79.50; "F" nickel shot for addition to cast iron, 74.50; "F" nickel, 5 lb ingots in kegs for addition to cast iron, 75.50. Prices f.o.b. Port Colborne, Ont., including import duty, New York basis, add 1.01. Nickel oxide sinter, 71.25 per lb of nickel content before 1 cent freight allowance, f.o.b. Copper Cliff, Ont.

Osmium: $70-100 per troy oz nom.

Palladium: $19-21 per troy oz.

Platinum: $72-75 per troy oz from refineries.

Radium: $16-21.50 per mg radium content, depending on quantity.

Rhodium: $118-125 per troy oz.

Ruthenium: $45-55 per troy oz.

Selenium: $7.00 per lb, commercial grade.

Silver: Open market, 88.625 per troy oz.

Sodium: 16.50, c.l.; 17.00 l.c.l.

Tantalum: Rod, $60 per lb; sheet, $55 per lb.

Tellurium: $1.65-1.85 per lb.

Thallium: $7.50 per lb.

Tin: Straits, N. Y., spot, 95.25; prompt, 95.125.

Titanium: Sponge, 99.3 + %, grade A-1 ductile (0.3% Fe max.), $2.25; grade A-2 (0.5% Fe max.), $2.00 per lb.

Tungsten: Powder, 98.8%, carbon reduced, 1000-lb lots, $3.15 per lb nom., f.o.b. shipping point; less than 1000 lb, add 15.00; 99 + % hydrogen reduced, $3.85.

Zinc: Prime Western, 10.00; brass special, 10.25; intermediate, 10.50, East St. Louis, freight allowed over 0.50 per lb, New York basis, add 0.50. High grade, 11.35; special high grade, 11.75 deld. Diecasting alloy ingot No. 3, 14.25; No. 2, 15.25; No. 5, 14.75 deld.,

Zirconium: Sponge, commercial grade, $5-10 per lb.

(Note: Chromium, manganese, and silicon metals are listed in ferroalloy section.)

SECONDARY METALS AND ALLOYS

Aluminum Ingot: Piston alloys, 23.00-25.50; No. 12 foundry alloy (No. 2 grade), 21.00-21.25; 5% silicon alloy, 0.60 Cu max., 25.00; 13 alloy, 0.60 Cu max., 25.00; 195 alloy, 24.00-25.75; 108 alloy, 21.50. Steel deoxidizing grades, notch bars, granulated or shot: Grade 1, 23.00; grade 2, 21.25; grade 3, 20.00; grade 4, 18.00.

Brass Ingot: Red brass, No. 115, 24.75; tin bronze, No. 225, 33.50; No. 245, 28.25; high-leaded tin bronze, No. 305, 28.75; No. 1 yellow, No. 405, 20.25; manganese bronze, No. 421, 22.50.

Magnesium Alloy Ingot: AZ63A, 37.50; AZ91B, 37.50; AZ91C, 41.25; AZ92A, 37.50.

NONFERROUS PRODUCTS

BERYLLIUM COPPER

(Base prices per lb, plus mill extras, 2000 to 5000 lb; nom. 1.9% Be alloy.) Strip, $1.80, f.o.b. Temple, Pa., or Reading, Pa.; rod, bar, wire, $1.78, f.o.b. Temple, Pa.

COPPER WIRE

Bare, soft, f.o.b. eastern mills, 30,000-lb lots, 30.355; l.c.l., 30.98. Weatherproof, 30,000-lb lots, 32.53; l.c.l., 33.28. Magnet wire deld., 38.43, before quantity discounts.

LEAD

(Prices to jobbers, f.o.b. Buffalo, Cleveland, Pittsburgh.) Sheets, full rolls, 140 sq ft or more, $18.50 per cwt; pipe, full coils, $18.50 per cwt; traps and bends, list prices plus 30%.

TITANIUM

(Prices per lb, 10,000 lb and over, f.o.b. mill.) Sheets and strip, $9.50-15.95; sheared mill plate, $8.00-11.50; wire, $7.50-11.50; forging billets, $6.00-7.60; hot-rolled and forged bars, $6.15-7.90.

ZINC

(Prices per lb, c.l., f.o.b. mill.) Sheets, 24.00; plate, $12.50-19.20; H.R. strip, $12.50-22.90; $11.00-17.40.

ZIRCONIUM

C.R. strip, $15.00-31.25; forged or H.R. bars, ribbon zinc in coils, 20.50; plates, 19.00.

NICKEL, MONEL, INCONEL

	"A" Nickel	Monel	Inconel
Sheets, C.R.	126	106	128
Strips, C.R.	124	108	138
Plate, H.R.	120	105	121
Rod, Shapes, H.R.	107	89	109
Seamless Tubes	157	129	200

ALUMINUM

Sheets: 1100 and 3003 mill finish (30,000 lb base; freight allowed).

Thickness Range Inches	Flat Sheet	Coiled Sheet
0.249-0.136	43.10-47.60	.....
0.135-0.096	43.60-48.70	40.50-41.10
0.095-0.077	44.30-50.50	40.60-41.30
0.076-0.061	44.90-52.80	40.80-42.00
0.060-0.048	45.60-55.10	41.40-43.10
0.047-0.038	46.20-57.90	41.90-44.50
0.037-0.030	46.60-62.90	42.30-46.30
0.029-0.024	47.20-54.70	42.60-47.00
0.023-0.019	48.20-58.10	43.70-45.40
0.018-0.017	49.00-55.40	44.30-46.00
0.016-0.015	49.90-56.30	45.10-46.80
0.014	50.90	46.10-47.80
0.013-0.012	52.10	46.80
0.011	53.10	48.00
0.010-0.0095	54.60	49.40
0.009-0.0085	55.90	50.90
0.008-0.0075	57.50	52.10
0.007	59.00	53.60
0.006	60.60	55.00

ALUMINUM (continued)

Plates and Circles: Thickness 0.250-3 in., 24-60 in. width or diam., 72-240 in. lengths.

Alloy	Plate Base	Circle Base
1100-F, 3003-F	42.70	47.50
5050-F	43.80	48.60
3004-F	44.80	50.50
5052-F	44.40	51.20
6061-T6	46.90	53.00
2024-T4	50.60	57.40
7075-T6*	58.40	66.00

*24-48 in. width or diam., 72-180 in. lengths.

Screw Machine Stock: 30,000 lb base.

Diam. (in.) or across flats	Round 2011-T3	Round 2017-T4	Hexagonal 2011-T3	Hexagonal 2017-T4
Drawn				
0.125	78.20	73.20	....	....
0.156-0.172	66.20	63.40	....	....
0.188	66.20	63.40	....	81.60
0.219-0.234	63.00	61.50	....	....
0.250-0.281	63.00	61.50	....	77.90
0.313	63.00	61.50	....	74.20
0.344	62.50	....	....	....
Cold-Finished				
0.375-0.547	62.50	61.30	74.80	69.80
0.563-0.688	62.50	61.30	71.10	65.50
0.719-1.000	61.00	59.70	64.90	61.70
1.063	61.00	59.70	....	59.60
1.125-1.500	58.60	57.40	62.80	59.60
Rolled				
1.563	57.00	55.70	....	....
1.625-2.000	56.30	54.90	....	57.50
2.125-2.500	54.80	53.40	....	....
2.563-3.375	53.20	51.70	....	....

Forging Stock: Round, Class 1, random lengths: 2014-F, 46.90-53.90, diam. 1-8 in.; 6061-F, 43.50-53.90, diam. 1-6 in.; 7075-F, 63.50-73.90, diam. 1-3.875 in.; 7079-F, 68.50-78.90, diam. 1-3.875 in.

Pipe: ASA schedule 40, alloy 6063-T6, standard lengths, plain ends, 90,000-lb base, per 100 ft.

Nom. Pipe Size (in.)		Nom. Pipe Size (in.)	
¾	$19.40	2	$ 59.90
1	30.50	4	165.05
1¼	41.30	6	296.10
1½	49.40	8	445.55

Extruded Solid Shapes:

Factor	Alloy 6063-T5	Alloy 6062-T6
9-11	45.40-47.00	60.60-64.80
12-14	45.70-47.20	61.30-65.80
15-17	45.90-47.90	62.50-67.50
18-20	46.50-48.30	64.50-70.10

MAGNESIUM

Sheet and Plate: AZ31B standard grade, 0.32 in., 103.10; .081 in., 77.90; .125 in., 70.40; .188 in., 69.00; .250-2.0 in., 67.90. AZ31B spec. grade, .032 in., 171.30; .081 in., 108.70; .125 in., 98.10; .188 in., 95.70; .250-2.00 in., 93.30. Tread plate, 60-192 in. lengths, 24-72 in. widths; .125 in., 74.90; .188 in., 71.70-72.70; .25-.75 in., 70.60-71.60. Tooling plate, .25-3.0 in., 73.00.

Extruded Solid Shapes:

Factor	Com. Grade (AZ31C)	Spec. Grade (AZ31B)
6-8	69.60-72.40	84.60-87.40
12-14	70.70-73.00	85.70-88.00
24-26	75.60-76.30	90.60-91.30
36-38	89.20-90.30	104.20-105.30

NONFERROUS SCRAP

DEALER'S BUYING PRICES

(Cents per pound, New York, in ton lots.)

Aluminum: 1100 clippings, 13.00-13.50; old sheets, 10.00-10.50; borings and turnings, 6.50-

BRASS MILL PRICES

	MILL PRODUCTS a				SCRAP ALLOWANCES f		
	Sheet, Strip, Plate	Rod	Wire	Seamless Tubes	Clean Heavy	Rod Ends	Clean Turnings
Copper	48.13b	45.36c	....	48.32	21.000	21.000	20.250
Yellow Brass	42.69	31.03d	43.23	45.60	16.125	15.875	14.500
Low Brass, 80%	44.90	44.84	45.44	47.71	17.875	17.625	17.125
Red Brass, 85%	45.67	45.61	46.21	48.48	18.625	18.375	17.875
Com. Bronze, 90%	46.98	46.92	47.52	49.54	19.250	19.000	18.500
Manganese Bronze	50.81	44.91	55.44	....	14.875	14.625	14.125
Muntz Metal	45.19	41.00	....	....	15.125	14.875	14.375
Naval Brass	47.07	41.38	54.13	50.48	14.875	14.625	14.125
Silicon Bronze	52.84	52.03	52.88	54.77	20.625	20.375	19.625
Nickel Silver, 10%	57.93	60.26	60.26	....	21.125	20.875	10.562
Phos. Bronze, A-5%	67.17	67.67	67.67	68.85	21.875	21.625	20.625

a. Cents per lb, f.o.b. mill; freight allowed on 500 lb or more. b. Hot-rolled. c. Cold-drawn. d. Free cutting. e. Prices in cents per lb for less than 20,000 lb, f.o.b. shipping point. On lots over 20,000 lb at one time, or any or all kinds of scrap, add 1 cent per lb.

7.00; crankcase, 10.00-10.50; industrial castings, 10.00-10.50.

Copper and Brass: No. 1 heavy copper and wire, 17.00-17.50; No. 2 heavy copper and wire, 15.00-15.25; light copper, 12.50-13.00; No. 1 composition red brass, 14.50-15.00; No. 1 composition turnings, 13.50-14.00; new brass clippings, 12.50-13.00; light brass, 8.50-9.00; heavy yellow brass, 10.00-10.25; new brass rod ends, 11.50-12.00; auto radiators, unsweated, 11.00-11.50; cocks and faucets, 11.50-12.00; brass pipe, 11.50-12.00.

Lead: Heavy, 8.50-8.75; battery plates, 3.50-3.75; linotype and stereotype, 10.50-11.00; electrotype, 9.50-10.00; mixed babbitt, 10.50-11.00.

Monel: Clippings, 28.00-29.00; old sheets, 25.00-26.00; turnings, 20.00-23.00; rods, 28.00-29.00.

Nickel: Sheets and clips, 42.00-45.00; rolled anodes, 42.00-45.00; turnings, 37.00-40.00; rod ends, 42.00-45.00.

Zinc: Old zinc, 3.00-3.25; new diecast scrap, 2.75-3.00; old diecast scrap, 1.50-1.75.

REFINERS' BUYING PRICES

(Cents per pound, carlots, delivered refinery)

Aluminum: 1100 clippings, 16.00-16.25; 3003 clippings, 16.00-16.25; 6151 clippings, 15.50-16.25; 5052 clippings, 15.50-15.75; 2014 clippings, 15.00-15.75; 2017 clippings, 15.00-15.75; 2024 clippings, 15.00-15.75; mixed clippings, 14.50-14.75; old sheets, 12.25-12.50; old cast, 12.25-12.50; clean old cable (free of steel), 15.25-15.50; borings and turnings, 12.75-13.75.

Beryllium Copper: Heavy scrap, 0.020-in. and heavier, not less than 1.5% Be, 51.00; light scrap, 46.00; turnings and borings, 31.00.

Copper and Brass: No. 1 heavy copper and wire, 18.75; No. 2 heavy copper and wire, 17.25; light copper, 15.00; refinery brass (60% copper) per dry copper content, 16.50.

INGOTMAKERS' BUYING PRICES

Copper and Brass: No. 1 heavy copper and wire, 18.75; No. 2 heavy copper and wire, 17.25; light copper, 15.00; No. 1 composition borings, 16.50; No. 1 composition solids, 17.00; heavy yellow brass solids, 11.50; yellow brass turnings, 10.50; radiators, 13.00.

PLATING MATERIALS

(F.o.b. shipping point, freight allowed on quantities)

ANODES

Cadmium: Special or patented shapes, $1.70 per lb.

Copper: Flat-rolled, 41.79; oval, 40.00, 5000-10,000 lb; electrodeposited, 31.25, 2000-5000 lb lots; cast, 36.25, 5000-10,000 lb quantities.

Nickel: Depolarized, less than 100 lb, 114.25; 100-499 lb, 112.00; 500-4999 lb, 107.50; 5000-29,999 lb, 105.25; 30,000 lb, 103.00. Carbonized, deduct 3 cents a lb.

Tin: Bar or slab, less than 200 lb, 113.50; 200-499 lb, 112.00; 500-999 lb, 111.50; 1000 lb or more, 111.00.

Zinc: Balls, 17.50; flat tops, 17.50; flats, 19.25; ovals, 18.50, ton lots.

CHEMICALS

Cadmium Oxide: $1.70 per lb in 100-lb drums.
Chromic Acid: 100 lb, 33.30; 500 lb, 32.80; 2000 lb, 32.15; 5000 lb, 31.80; 10,000 lb, 31.30; f.o.b. Detroit.
Copper Cyanide: 100-200 lb, 68.40; 300-900 lb, 66.40; 1000-19,900 lb, 64.40.
Copper Sulphate: 100-1900 lb, 13.70; 2000-5900 lb, 11.70; 6000-11,900 lb, 11.45; 12,000-22,900 lb, 11.20; 23,000 lb or more, 10.70.
Nickel Chloride: 100 lb, 48.50; 200 lb, 46.50; 300 lb, 45.50; 400-9999 lb, 43.50; 10,000 lb or more, 40.50.
Nickel Sulphate: 5000-22,000 lb, 33.50; 23,000-35,900 lb, 33.00; 36,000 lb or more, 32.50.
Sodium Cyanide: 100 lb, 27.60; 200 lb, 25.90; 400 lb, 22.90; 1000 lb, 21.90; f.o.b. Detroit.
Sodium Stannate: Less than 100 lb, 75.80; 100-600 lb, 66.80; 700-1900 lb, 64.00; 2000-9900 lb, 62.20; 10,000 lb or more, 60.80.
Stannous Chloride (anhydrous): Less than 25 lb, 165.30; 25 lb, 130.30; 100 lb, 115.30; 400 lb, 112.90; 5200-19,600 lb, 100.70; 20,000 lb or more, 88.50.
Stannous Sulphate: Less than 50 lb, 128.10; 50 lb, 98.10; 100-1900 lb, 96.10; 2000 lb or more, 94.10.
Zinc Cyanide: 100-200 lb, 59.00; 300-900 lb, 57.00.

(*Concluded from Page 187*)

grades also are quoted higher. No. 1 heavy melting is up $3 to $32-$33.

St. Louis—Scrap is moving at the slowest pace in months. Prices are steady, but there are no orders to confirm them. Steel mill operations, already low, threaten to go lower. Mill ground stocks of scrap are 60 to 90 days on the average, and as high as 120 days in a few instances. Output of industrial scrap is low and rural collections are reported slower.

Birmingham — Scrap movement here is at a minimum. Open-hearth steel buyers are out of the market. One major user of cast scrap is buying, and only two or three small electric furnaces are placing orders —they paid above the market for tonnages. The export market is steady.

Los Angeles—Steelmaking operations continue depressed, and the local scrap market is at a virtual standstill. Prices are soft.

San Francisco — The local mills are taking only negligible tonnages, but price postings for March are unchanged.

Pig Iron . . .

Pig Iron Prices, Page 181

Merchant pig iron consumers are buying only small quantities, mostly trucklots. They are carrying little stock, amounting to not more than two weeks' supply in numerous instances. They know they can obtain prompt delivery.

Heavy snows and extremely cold weather in many sections have forced a postponement of late winter and early spring work on farms. The agricultural implement industry is maintaining operations at a fairly stable level—it is the busiest sector of the gray iron and malleable foundry industry.

Most gray iron jobbing shops are running only 24 to 32 hours a week. Their ordering of coke and pig iron is proportionately light and is largely hand to mouth.

Merchant iron sellers anticipate no sales improvement this month. Some would settle for as much tonnage as they booked in February.

With the supply of iron well in excess of demand, production is being curtailed. Republic Steel Corp. suspended operations at its Troy, N. Y., blast furnace. The spiegeleisen furnace of the New Jersey Zinc Co. at Palmerton, Pa., is scheduled to suspend operations later this month. In the Chicago district, only 25 of 43 blast furnaces are operating.

Warehouse . . .

Warehouse Prices, Page 181

The warehouse market is still dull. Absence of strong demand for any product keeps sales 20 to 25 per cent below last year's levels. No seasonal pickup in orders placed by the construction industry is expected until April.

Distributors are restricting their purchases from mills, with the volume for first quarter delivery at the lowest point recorded in the postwar period. Their inventories are well balanced and ample to meet all foreseeable demands. In some instances, stocks of plates and structurals are excessive, because of the rapid easing of those products at mill level. Many users are buying from mills instead of warehouses.

One Pittsburgh district mill, equalizing on carbon sheets, is shipping wasters and overruns into New England at lower prices.

CLASSIFIED

WANT TO BUY

Steel By-Products Discs

2" to 2½" Diameter .060 to .125
4½" Diameter .060 to .125
6½" to 10" Diameter .060 to .125
11" to 12½" Diameter .085 to .095

Hot or Cold Rolled

KEYSTONE LAMP MFG. CORP.
Purchasing Department
Phone Slatington, Pa. POrter 7-3821

WANTED

One 30 to 50 ton steam locomotive crane. Will consider converted or diesel unit. Give full detailed description.

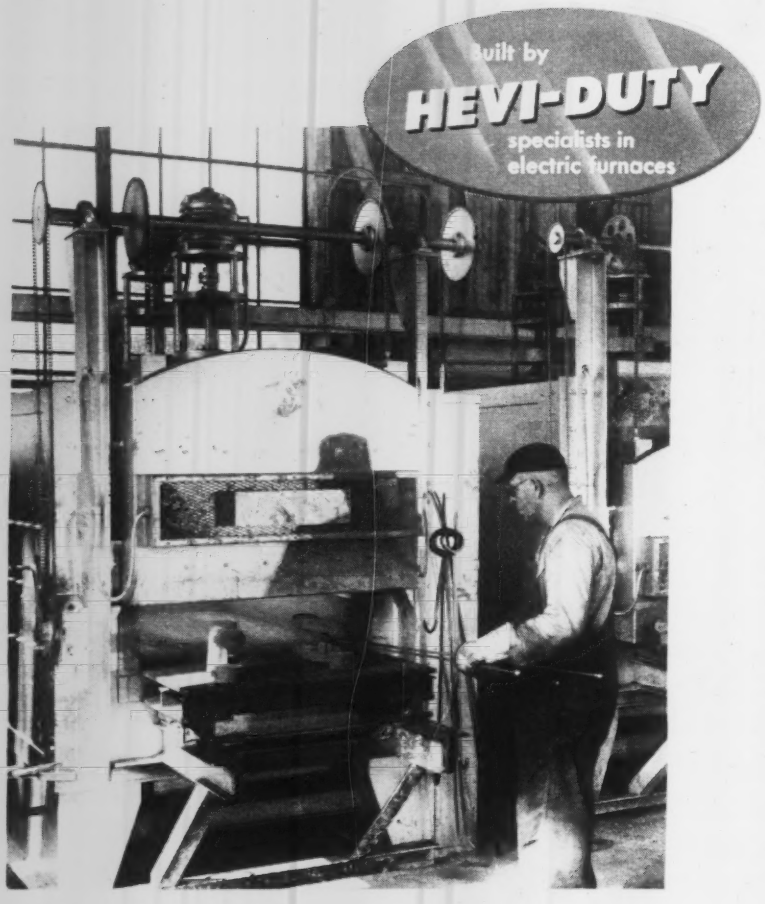
EQUITABLE EQUIPMENT CO., INC.
410 Camp St. New Orleans 12, La.
Attention: Mr. R. C. Hutchinson

Positions Wanted

SALES EXECUTIVE: Graduate engineer with extensive background in sales management, engineering, production and costing of alloys and their fabrication into process equipment for the chemical, petroleum, pharmaceutical and A.E.C. fields. Write Box 641, STEEL, Penton Bldg., Cleveland 13, Ohio.

SALES ENGINEER: Mature, experienced mill, foundry, and sales: carbon, alloy, and special steels. Greater Harrisburg, Pa. area. Box No. 645, STEEL, Penton Bldg., Cleveland 13, Ohio.

MERCHANT MILL ROLLER required for Integrated Steel Plant. Write Box 644, STEEL, Penton Bldg., Cleveland 13, Ohio.



Byron Jackson Division, Borg-Warner Corporation, hardens and tempers high-strength components for oil well tools in this Hevi-Duty box furnace

Steel parts processed by Byron Jackson, Los Angeles, face unusually tough tests. They are used in oil well tools where every additional foot of depth adds still further to the weight, strain and torsional stress. In one instance, this equipment drilled to a depth of 23,000 feet — the greatest depth ever attained to date.

Byron Jackson found that components both hardened and drawn in the Hevi-Duty Multi-Range furnace provided maximum high strength characteristics. The wide temperature range combined with precise, uniform control make this furnace ideal for both operations.

Write for Bulletin 341 for complete information on Hevi-Duty Multi-Range Box Furnaces.

- Heat Processing Furnaces
- Dry Type Transformers
- Constant Current Regulators

HEVI-DUTY ELECTRIC CO.
Milwaukee 1, Wisconsin

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STEEL
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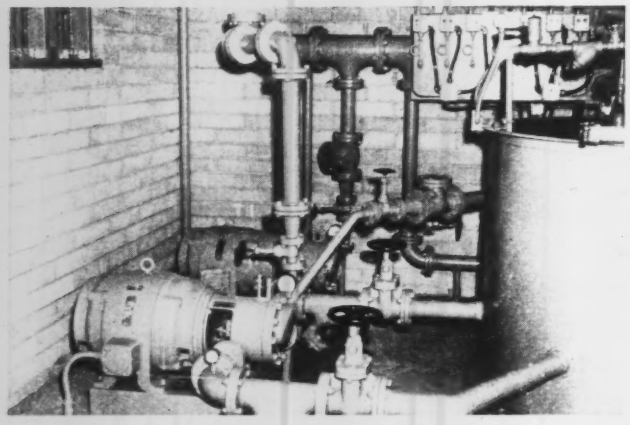

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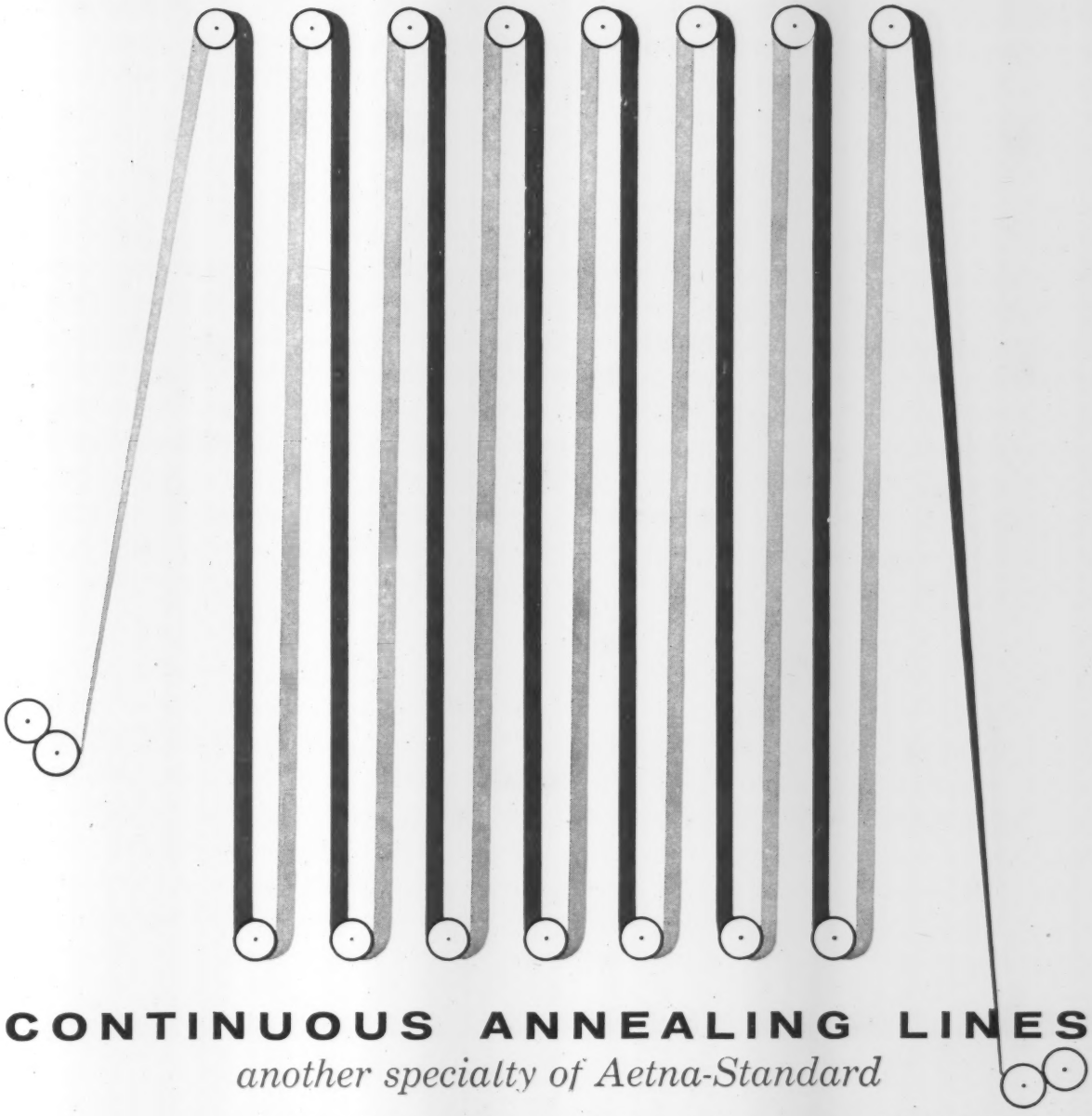

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